BURNED AREA EMERGENCY RESPONSE PLAN REVIEW AND APPROVAL

| I. Project Leader approval that the Burned Area Emergency Response Plan mee land management plan management objectives. | ets approved |
|---|--------------|
| Gregory M. Hughes, Project Leader, MID-COLUMBIA RIVER NWR COMPLE | X Date |
| II. Regional Fire Management Coordinator concurrence that the plan fits the tedefinition for use of Emergency Stabilization funding. | echnical |
| Regional Fire Management Coordinator, Region 1 | Date |
| III. Emergency Stabilization Funding Approval (check one box below): | |
| Approved | |
| Approved with Revision (see attached) | |
| Disapproved | |
| | |
| Regional Director, Region 1 | Date |
| IV. Emergency Stabilization Funding Approval (check one box below): | |
| Approved | |
| Approved with Revision (see attached) | |
| Disapproved | |
| | |
| National Office | Date |

UPPER GOOSE FIRE BURNED AREA EMERGENCY RESPONSE PLAN



UNIT: COLUMBIA NATIONAL WILDLIFE REFUGE

LOCATION: Grant and Adams Counties, Washington

DATE: October 1, 2007

PREPARED BY: FIRST STRIKE ENVIRONMENTAL CO., BAER TEAM

| Submitted By: | : | _ Date: | October 1, 2007 |
|---------------|----------------------------|---------|-----------------|
| • | Leo Sidebotham Team Leader | | |

EXECUTIVE SUMMARY

Introduction

This Burned Area Emergency Response Plan has been prepared in accordance with Department of the Interior and the U.S. FISH AND WILDLIFE SERVICE policy. This plan provides emergency stabilization recommendations for all lands burned within the UPPER GOOSE Fire perimeter and downstream impact areas including: public lands administered by the U.S. FISH AND WILDLIFE SERVICE and other jurisdictions if necessary. The primary objectives of the UPPER GOOSE Fire Burned Area Emergency Response Plan are:

- To prescribe cost effective post-fire stabilization measures necessary to protect human life, property, and critical cultural and natural resources.
- To promptly stabilize and prevent further degradation to affected resources on lands within the fire perimeter and downstream impacted areas in accordance with approved land management plans and policies, and all relevant federal, state, and local laws and regulations.
- Minimize the establishment of non-native invasive species within the burned area.

This plan addresses the emergency stabilization and fire suppression impacts/ fire related damages to lands administered by the Service on the Mid-Columbia National Wildlife Refuge (Refuge). Based upon field assessments conducted by Refuge staff from July 13 – 16 and 23-24, 2007, an analysis was conducted to include: suppression impacts, archaeological and vegetation impacts, fire effects on known threatened and endangered (T&E) species and their habitats. USFWS Archeologists examined records of previously recorded cultural resources within the fire boundaries and initiated a cultural resource damage assessment. The wildlife biologist/vegetation specialist evaluated and assessed fire damages and suppression impacts to vegetative resources, including threatened and endangered (T&E) species, and identified values at risk associated with vegetative losses. The wetland biologist evaluated risks associated with riparian and wetland areas. The wildlife biologist conducted an assessment of T&E species, and other species of management concern to the Refuge. The soil specialist and geologist evaluated damage to roads and erosion-prone areas.

Individual resource Burned Area Assessment Reports produced by these specialists are in Appendix I. The individual emergency stabilization treatments specifications including effectiveness monitoring identified in the assessments can be found in Part F. A summary of the costs by jurisdictions is in Part E. Appendix II contains the National Environmental Policy Act (NEPA) compliance documentation summary. Appendix III contains the Burned Area Emergency Response Plan maps. Appendix IV contains photo documentation. Appendix V contains supporting documentation.

35% was consumed by a moderately intense backing fire. Total acres burned for this fire were 2,258 acres with 705 of those acres being on U.S. Fish and Wildlife Service (USFWS) managed land.

The area was burned previously by the 1992 Goose Lake Fire. The effects of that fire were similar to the damage observed from the current Upper Goose Fire. Evidence of extensive erosion problems related to the 1992 fire was not observed. The emergency stabilization measures recommended for the 1992 fire were apparently successful in stabilizing fire related degradation of soil and watershed quality.

Ground disturbance along the fire edge was substantial given the fire location and the necessary fire suppression actions (i.e. bulldozing actions) that were employed to prevent the loss of additional acres. Approximately 0.5 miles of dozer line was employed during the fire suppression action. Drought (extremely dry) conditions along with gusting winds had the potential to result in extreme fire behavior, lofting fire brands, and high potential for fire spread. Approximately 1 acre (based on 16-foot width) was impacted due to 0.5 mile of dozer line suppression during the Upper Goose Fire.

The road and fence damage assessments are based on field observations and discussions with Randy Hill and Rick Poetter, of the U.S. Fish and Wildlife Service. Approximately 2 miles of gravel roads and 5 miles of ungraveled access roads were damaged from suppression activities. Off-road soil/vegetation damage was observed on approximately 4 miles of newly created tracks. In addition, a 0.5 acre staging area was damaged/denuded by fire-related vehicles.

The fence along the west boundary and the fence that separates Para land at the Adams County line (including wooden sign posts and refuge boundary signs) were either damaged or destroyed. The lack of adequate fencing could allow cattle grazing on adjacent lands to easily move onto the NWR land and graze on the remaining vegetation or new vegetation. Cattle movement will adversely impact soil conditions, increasing the amount of soil loss due to wind erosion.

The fire damage to vegetation can be summarized as follows:

- Approximately 70 to 85% of the area within the fire limits was burned.
- Approximately 30% of the burned area is susceptible to wind erosion.
- Burn intensities for the area burned can be divided into: 40% low intensity, 45% moderate intensity, and 15% severe intensity.
- Approximately 90 to 95 % of the vegetation was burned. Regeneration success for bunch grass is anticipated to be 60% and cheat grass is anticipated to be greater than 70%.

Most sagebrush, bunchgrass, and cheatgrass communities experienced greater than 90 to 95 percent vegetation loss of above-ground cover. It was observed that approximately 70-85 percent of the Upper Goose Fire area completely consumed all vegetation resources. This estimate excludes a large plateau that was not burned but

remains within the fire perimeter boundary. The area burned by the Upper Goose Fire had previously been burned in 1992 which limited the vegetative coverage including high densities of sagebrush. The current fire burned or scorched the remaining mature sagebrush leaving no seed source for future regeneration.

| Fire Severity | Percent Affected | | |
|---------------|------------------|--|--|
| Low | 40% | | |
| Medium | 45% | | |
| High | 15% | | |

| Breakdown of Area | Percent Affected |
|-------------------------------------|------------------|
| Total percent burned | 70-85% |
| Total area affected by wind erosion | 30% |
| Total percent vegetation affected | 90-95% |

| Breakdown of Major Plants | Percent Affected |
|---------------------------|------------------|
| Sage | 95-100% |
| Bunchgrass | 90-95% |
| Cheatgrass | 95-100% |

Vegetation resources were directly impacted by the Upper Goose Fire and by suppression tactics utilized for fire control. Documented impacts to vegetation resulted from:

- a) Potential for invasion by aggressive non-native species throughout the disturbed site
- b) Impacts to native shrub and grass species during suppression and mop-up activities.
- c) Vegetation losses due to fire intensity. Most sagebrush and grassland communities were completely consumed and/or scorched. Some additional loss is expected within the remaining shrub communities.
- d) Loss of the organic litter layer on approximately 95 percent of the Fire area.

Negative impacts resulting from vegetation losses include a reduction in wildlife habitat, forage for wildlife species, visual quality degradation, increased non-native species invasion, bare soils, and reduced species diversity. The loss of wildlife habitat and potential impacts to Threatened and Endangered Species are discussed further within the Wildlife Assessment.

The role of microbiotic crusts (MBC) in shrub-steppe ecosystems is still incompletely

Fire Background

The lightening-caused Upper Goose Fire, fire number 13580-9141-DQJ1 was reported at approximately 1330 hours on July 13, 2007. Firefighters from Adams and Grant Counties responded to this incident, with Grant County 4 providing the initial attack resources on the fire start date of July 13, 2007. No USFWS resources were left in the complex to assist in the initial attach (IA) effort due to multiple other starts on refuge managed lands. Containment efforts proved to be difficult in the Initial attack phase due to the rough terrain and high, gusty, erratic winds.

Initial suppression tactics were to hold the fire at Morgan Lake Road on the east side, and hold the fire on the MU III access road on the south side. The north and west sides were in good shape as the fire was contained by Upper and Lower Goose lakes along with there associated drainages. Due to the higher than expected humidity's on the night of the 13th the fire was pretty much put out on the south, east, and southwest sections. Mop up tactics were employed to secure these edges throughout the day (July 14). The northwest corner of the fire continued to burn into the next burn period (July 14).

The Refuge ES Team, tasked with evaluation of short and long-term emergency stabilization needs, developed this plan to address the following issues:

- Cultural and natural resource values impacted by the fire or fire suppression actions.
- ES requirements established by Federal laws, policies, and relevant Department of the Interior resource management mandates.
- Rehabilitation requirements established by state laws, policies, and regulations.
- Implementation of treatments in a timely manner, prior to the first damaging winds and rains.

The Upper Goose Fire burned approximately 705 acres of the Mid-Columbia Refuge, per Map dated September 6, 2007, Appendix III. Though the fire was contained on July 15, the field assessment was delayed until August 1 partly due to the road damage from fire suppression activities causing it to be inaccessible and partly due to an initial attempt to contract out a BAER/ESR plan which was not carried though. An extension for completion of the plan was requested.

Fire Damages and Threats to Human Safety and Natural and Cultural Resources

The Upper Goose Fire, fire number 13580-9141-DQJ1 was reported at approximately 1330 hours on July 13, 2007. The Upper Goose Fire demonstrated extreme fire intensity on about 65-percent (%) of the burned area as it was pushed through the shrub-steppe community by gusting and fire generated convective winds. Afternoon wind-driven flames moved quickly across small areas before being slowed by canyon walls. Much of the fire moved slowly through a large part of the burned area as humidity rose and winds diminished toward the evening and overnight. The remaining

understood (Evans and Lih 2005:106) and estimating the magnitude and extent of MBC damage from the Upper Goose Fire is a complex task that is beyond the scope of BAER field survey and assessment. Therefore, this assessment can make no definitive conclusions about the area wide condition and location of the MBC and the emergency stabilization measures recommended reflect this finding.

The Fire presents a large-scale disturbance and created new open sites vulnerable to weed invasion, creating a fertile bed for the rapid colonization and spread of non-native species, especially coupled with the added nutrients from the ash. Thus, invasive species and noxious weeds which compete with the recovery of native vegetation are likely become established and/or spread within the burned area.

Concern has been expressed over the loss of vegetation cover within the Upper Goose Fire area. Stabilization and re-vegetation of those areas is needed to ensure ecological function. Re-vegetation in the area should be conducted in order to protect soils in the area reducing the erosional affects that wind and water can generate.

Emergency stabilization includes application of pesticide spray to significantly reduce invasive weed spread and diminish threats in areas of concern from noxious weeds and non-native species. After the spray aerial and drill seeding of native plants mix to establish prolific native colonies and minimize invasive weed infestation into non-infested areas.

None of the wetland or riparian areas were impacted by the Fire. Due to the lowered intensity burn near the associated areas and the inherent fire retarding abilities of wetland vegetation, neither of these resources were harmed. However, the areas surrounding the wetland and riparian resources were impacted and emergency stabilization of the surrounding shrub-steppe habitat is recommended to avoid erosion damage and non-native species recruitment.

The significant wildlife species under the jurisdiction of the Refuge that are known to occur or have the potential to occur in the fire area during at least portions of the year include:

Bald eagle (Haliaaetus leucocephalus)

Washington ground squirrel (Spermophilus washingtoni)

Ferruginous hawk (Buteo regalis)

Loggerhead shrike (Lanius Iudovicianus)

Striped whipsnake (Masticophus taeniatus)

Black-tailed jackrabbit (Lepus californicus)

Mule deer (Odocoileus hemionus)

Although the Upper Goose Fire had no effect on bald eagles either directly or indirectly. The burn area is potential habitat for Washington ground squirrels, ferruginous hawk, loggerhead shrikes, striped whipsnake, black-tailed jackrabbit and of tribal importance to mule deer. The habitat of the above selected wildlife has been functionally damaged by the fire and the emergency stabilization measures recommended in the vegetation

assessment is necessary for the recovery of these areas to pre-fire condition.

Most sagebrush, bunchgrass, and cheatgrass communities experienced greater than 90 to 95 percent vegetation loss of above-ground cover. It was observed that approximately 70-85 percent of the Upper Goose Fire area completely consumed all vegetation resources. This estimate excludes a large plateau that was not burned but remains within the fire perimeter boundary. The area burned by the Upper Goose Fire had previously been burned in 1992 which limited the vegetative coverage including high densities of sagebrush. The current fire burned or scorched the remaining mature sagebrush leaving no seed source for future regeneration.

The following recommendations are offered to assist in the timely recovery of the Upper Goose Fire:

To reduce the impacts of wind erosion areas that can be seeded should be. Seed drilling, aerial broadcast, and tractor based broadcast seeding is recommended. These stabilization measures are further detailed in the vegetation assessment. Therefore the recommendation is to implement the measures specified in the Vegetation Damage Assessment.

Emergency Stabilization Treatments

- Conduct cultural compliance prior to implementation of stabilization treatments.
- Stabilize soil to prevent loss or degradation of productivity by seeding to prevent establishment of invasive plants; and by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area.

The major impediments to implementing the recommended ES measures include steep slopes and access to selected areas using existing roads.

COLUMBIA NATIONAL WILDLIFE REFUGE Management Requirements

Establishing legislation designated Columbia National Wildlife Refuge "... as a refuge and breeding ground for migratory birds and other wildlife..." the uniqueness and biological diversity of the Refuge is established by three elements of land management. First, this area was set aside from irrigated agricultural development during planning stages of the Columbia basin irrigation Project due to its strategic location along the Potholes Canal and Crab Creek. Second, it lies within a mostly rocky area that has maintained the shrug-steppe component in a relatively large block with State-managed and private lands. Third, unlike surrounding properties the Refuge lands have not been intentionally grazed for nearly 25 years, protecting bunchgrass and sagebrush stands from degradation. Within its mosaic of habitats, the Refuge supports a wealth of

increasingly uncommon native plant and animal species. Because of the high diversity of native plant and animal species, the well developed microbiotic crusts and significant breeding populations of many steppe and shrub-steppe dependent species, the service has been tasked to preserve and protect these lands fro future generations. Primary goals for the Refuge include:

- Provide habitat for migratory birds, especially ducks, geese, swans, and cranes, during the spring/fall staging and winter periods.
- Protect, restore and develop habitats for an otherwise support the recovery of federally-listed endangered and threatened species, and help prevent the listing of species of management concern.
- Protect and restore a diversity of native habitats for indigenous fish, wildlife, and plants within the Columbia Basin ecoregion.
- Provide high-quality opportunities for wildlife-dependent recreation and environmental education to enhance public appreciation, understanding, and enjoyment of fish, wildlife, habitats, and cultural resources.

Emergency Stabilization:

The emergency stabilization measures recommended in this ES Plan are consistent with and help fulfill the local planning agency goals/objectives including the Columbia National Wildlife Refuge management requirements, Federal and State Threatened and Endangered Species regulations, and cultural resource restrictions:

- Noxious weed and invasive species control to protect the habitat of T&E vegetation and wildlife of the site.
- Ecological stabilization through planting of native species to prevent the reestablishment and spread of non-native invasive plants (Appendix I and V).
- Conduct cultural compliance prior to implementation of stabillization treatments.
- Monitor treatment effectiveness for site stabilization.

Application of herbicide and planting of native seeds (including aerial seeding) to restore areas before invasive species become established is well supported by recent research (Bakker & Wilson, 2004:1058-1064) (Huddleston & Young 2005:507-515) (Thompson & Rounding, 2006) (Seabloom & Harpole 2003).

Evans and Lih (2005) findings/conclusions support the recommended Upper Goose Fire ES measures over natural recovery:

- Careful management... and a long term commitment to integrated and adaptive approaches to invasive species management, fire management and restoration practices will be required to successfully manage the ALE Reserve and other shrub-steppe ecosystems in the coming years.
- Aggressive management activity to control cheatgrass and to enhance the

- recovery of natural structure and function of sagebrush shrubland stands will be critical to the long-term ecological integrity of these habitats.
- The problem of cheatgrass must be addressed in relation to native plant community health and fire management practices. There are no simple answers; no permanent solution to the problem of cheatgrass control is currently available and management is extremely challenging.
- The rates of grass seedling emergence and recruitment from aerial seeding efforts observed in the study are probably typical of broadcast seeding efforts in the arid West. (*This infers that aerial seeding is a typical broadcast seeding practice in similar areas of the Western U.S*).

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PART A - FIRE LOCATION AND BACKGROUND INFORMATION

| Fire Name | Upper Goose Fire |
|---|---|
| Fire Number | 13580-9141-DQJ1 |
| Agency Unit | U.S. Fish and Wildlife Service, Mid-Columbia River National Wildlife Refuge Complex |
| Region | USFWS Region 1 |
| State | Washington |
| County(s) | Grant, Adams |
| Ignition Date/Cause | 7/13/07 – lightning |
| Zone | CWICC |
| Date Fully Contained | 7/15/2007 |
| Jurisdiction | |
| Mid-Columbia River National Wildlife Refuge Complex (including WA DNR-owned) | 705-Acres |
| Other jurisdictions | 1,553-Acres |
| Total Acres | 2,258-Acres |
| Date Contained | 7/15/2007 |

PART B - NATURE OF PLAN

Type of Action (check one box below)

| X | Initial Submission |
|---|-------------------------------------|
| | Amendment to the Initial Submission |

PART C - EMERGENCY STABILIZATION ASSESSMENT

Emergency Stabilization Objectives

- To prescribe cost effective post-fire stabilization measures necessary to protect human life, property, and critical cultural and natural resources.
- To promptly stabilize and prevent further degradation to affected resources on lands within the fire perimeter and downstream impacted areas in accordance with approved land management plans and policies, and all relevant federal, state, and local laws and regulations.
- Minimize the establishment of non-native invasive species within the burned area

PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS

I. Burned Area Emergency Response Team Members: (List of technical specialists used to develop the plan)

| Position | Team Member (Agency) | | | |
|-------------------------------------|--|--|--|--|
| Team Leader | Leo Sidebotham (FSE) | | | |
| Public Information | Paula Call (USFWS) | | | |
| Operations | Gary Fegert, USFWS/Randy Hill (USFWS) | | | |
| Environmental Compliance & Planning | Robert Krueger (FSE) | | | |
| NEPA Advisor | | | | |
| Hydrologist/Geologist | Craig Fanshier (FSE/Shaw) | | | |
| Watershed Scientist | Wayne Coppel (FSE/Shaw) | | | |
| Soil Scientist | Randy Hill (USFWS)/Todd Martin (FSE/Shaw) | | | |
| Cultural Resources/Archeologist | Jorie Clark (USFWS) | | | |
| Vegetation Specialist | Randy Hill, Heidi Newsome (USFWS)/Rebecca Meyers (FSE/Shaw) | | | |
| Wildlife Biologist | Randy Hill, Howard Browers (USFWS)/Bruce Kvam (FSE/Shaw) | | | |
| GIS Specialist | Lindsey Hayes, Kevin Goldie, Andrew Stinchfield (USFWS) | | | |
| Documentation/Computer Specialist | Michele Krueger, Lori Lane, Lori Onate (FSE)/Wayne Coppel (FSE/Shaw) | | | |
| Photographer | Randy Hill (USFWS)/ Craig Fanshier, Todd Martin (FSE/Shaw) | | | |

III. Resource Advisors: (Note: Resource Advisors are individuals who assisted the burned area emergency response team with the preparation of the plan. See Part H for a full list of agencies and individuals who were consulted or otherwise contributed to the development of the plan.

| Name | Affiliation | | |
|-------------------|--|--|--|
| Gregory M. Hughes | Project Leader, Mid-Columbia River National Wildlife Refuge Complex | | |
| Rick Poetter | Columbia Refuge Manager, U.S. Fish and Wildlife Service | | |
| Chris Schulte | Fire Management Officer, Mid-Columbia River National Wildlife Refuge Complex | | |
| Mike Ritter | Deputy Project Leader, Mid-Columbia River National Wildlife Refuge Complex | | |
| Howard Browers | Biologist, U.S. Fish and Wildlife Service | | |
| Erika Britney | Senior Review, FSE/Shaw (Wildlife, Vegetation) | | |
| Debra Carey | Senior Review, FSE/Shaw (Hydrology, Geology) | | |

PART E - SUMMARY OF ACTIVITIES AND COSTS

The summary of activities and cost table below identifies emergency stabilization costs charged or proposed for funding from subactivity 9142 funding sources.

$EMERGENCY\ STABILIZATION\ ACTIVITIES\ COST\ SUMMARY\ TABLE-Upper\ Goose\ Fire$

| Spec # | Title | Unit | Unit Cost | # of Units | Work Agent | Cost |
|------------|---|-------|-------------|--------------|------------|--------------|
| 1 | Conduct cultural resources compliance prior to stabilization treatment implementation | Acres | \$31.90 | 705 | FA | \$22,519.90 |
| 2 | Non-native invasive species control- Integrated Pest Management | Acres | \$87.93 | 705 | FA/C | \$61,993.00 |
| 3 | Ecological Stabilization- Native Seeding | Acres | \$351.90 | 705 | FA/C | \$248,088.40 |
| 4 | Emergency Stabilization Plan Development | Plan | \$32,400.00 | 1 | FA | \$32,400.00 |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| TOTAL COST | | | | \$365,001.30 | | |
| | | | | | | |

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permitee, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

PART F - INDIVIDUAL SPECIFICATIONS

| TREATMENT/ACTIVITY NAME | Conduct Cultural resources Compliance | PART E SPECIFICATION # | 1 |
|---------------------------------|---------------------------------------|----------------------------------|------|
| NFPORS TREATMENT CATEGORY* | Heritage Resources | FISCAL YEAR(S) (list each year): | 2008 |
| NFPORS TREATMENT TYPE * | Protect Heritage Sites | WUI? Y/N | N |
| IMPACTED COMMUNITIES AT RISK | None | IMPACTED T&E SPECIES | None |

^{*} See Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

I. WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: A records search at the Washington SHPO did not identify any previously recorded historic sites within or adjacent to the Upper Goose fire area. Conduct cultural resources compliance prior to implementation of stabilization treatments. artifacts.

B. Location/(Suitable) Sites: The study area for the cultural resource is the burn area (705 acres).

C. Design/Construction Specifications:

- 1. Conduct cultural compliance prior to implementation of stabilization treatments.
- 2. Evaluate and document findings.
- 3. Conduct Tribal consultation.
- D. Purpose of Treatment Specification: This action is necessary to meet legislative mandates under Section 106 of the National Historic Preservation Act and 36 CFR 800.

II. LABOR, MATERIALS AND OTHER COST:

| PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below). | COST / ITEM |
|---|----------------|
| Principal Investigator and Project Manager 140 hours @ \$80/hour | 11,200.00 |
| Crew Chief 75 hours @ \$50/hour | 3,750.00 |
| Crew 75 hours @ \$28/hour | 2,100.00 |
| FWS Tribal consultation/interviews \$400/day for 2 days | 800.00 |
| TOTAL PERSONNEL SERVICE COST | 17,850.00 |
| EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting. | COST / ITEM |
| TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST | |
| MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item): | COST / ITEM |
| TOTAL MATERIALS AND SUPPLY COST | |

| A. TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item): | COST / ITEM |
|---|----------------|
| 4 X 4 Pickup @ .485/mile x 100 miles/day x 17 days x 1 FY's –Field visits | 824.50 |
| ATV Unit @ \$100/day x 15-days | 1,500.00 |
| 2 each – Round Trip travel from Regional Cultural Resources Office in Sherwood Oregon : 490 Miles @ .485/mile | 475.40 |
| Per diem Lodging and meals, Richland Washington 17 days (lodging \$60/day and Meals & incidentals \$50/day) | 1,870.00 |
| TOTAL TRAVEL CO | ST 4,669.90 |
| CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item): | COST / ITEM |
| TOTAL CONTRACT CO | ST 4,669.90 |

SPECIFICATION COST SUMMARY

| FISCAL YEAR | PLANNED INITIATION DATE (M/D/YYYY | PLANNED COMPLETION DATE (M/D/YYYY) | WORK AGENT | UNITS | UNIT COST | PLANNED ACCOMPL ISHMENTS | PLANNED COST |
|----------------|--------------------------------------|---------------------------------------|---------------|-------|--------------|--------------------------------|-----------------|
| FY08 | 10/01/2007 | 7/28/2008 | FA | Acres | 31.90 | 705 | 22,519.90 |
| | | | | | | TOTAL | 22,519.90 |

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

| 1. | Estimate obtained from 2-3 independent contractual sources. | |
|----|---|---|
| 2. | Documented cost figures from similar project work obtained from local agency sources. | Р |
| 3. | Estimate supported by cost guides from independent sources or other federal agencies | |
| 4. | Estimates based upon government wage rates and material cost. | |
| 5. | No cost estimate required - cost charged to Fire Suppression Account | |

 $[\]mathbf{P} = \text{Personnel Services}, \quad \mathbf{E} = \text{Equipment} \quad \mathbf{M} = \text{Materials/Supplies}, \quad \mathbf{T} = \text{Travel}, \quad \mathbf{C} = \text{Contract}, \quad \mathbf{F} = \text{Suppression}$

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Cultural Resource Burned Area Assessment.

IV. TOTAL COST BY JURSIDICTION

| JURISDICTION | UNITS TREATED | COST |
|---|---------------|-------------|
| U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex | 705 | 22,519.90 |
| | | |
| | | |
| | TOTAL COST | \$22,519.90 |

PART F - INDIVIDUAL SPECIFICATION

| TREATMENT/ACTIVITY NAME | | PART E SPECIFICATION # | 2 |
|---------------------------------|--------------------------------|----------------------------------|--|
| NFPORS TREATMENT CATEGORY* | Invasive Species | FISCAL YEAR(S) (list each year): | 2007, 2008 |
| NFPORS TREATMENT TYPE * | Chemical/Biological/Mechanical | WUI? Y/N | N |
| IMPACTED COMMUNITIES AT RISK | | IMPACTED T&E SPECIES | Washington ground squirrel (Candidate), Ferruginous hawk (Species of concern) |

^{*} See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

- A. General Description: The specification will stabilize soil to prevent loss or degradation of productivity by direct treatment of invasive plants by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area. Control noxious weed infestations remaining within Upper Goose Fire area prior to seed-set and maturation. Control new infestations in fall of 2007 and spring of 2008. Current weed species observed include Diffuse knapweed (*Centaurea diffusa*), Kochia (*Bassia scoparia*), and Russian thistle (*Salsola kali*). Utilize integrated pest management techniques (herbicides, biological, mechanical and cultural control methods) as appropriate to prevent the spread and establishment of noxious weeds within the fire area. Control Cheatgrass (*Bromus tectorum*) that germinates in fall of 2007 and spring of 2008 to reduce competition with native species recovery and reseeding efforts.
- B. Location/(Suitable) Sites: Control all visible noxious weed populations along roads, trails and disturbed sites within the fire area. Control sites identified include dozerlines, disklines, known infestations of Diffuse knapweed, Kochia, and Russian thistle. Control non-native invasive species, such as Cheatgrass, within the fire perimeter to decrease competition for native grass seeded species.
- C. Design/Construction Specifications:
- 1. Control known populations of noxious weeds as identified in USFWS reviews (approximately 100 acres of broadleaves and 705 acres of cheatgrass) prior to seed set
- 2. Recommended herbicides for Diffuse knapweed, Kochia, and Russian thistle, within upland shrub-steppe areas, are biological control agents. Recommended herbicide for cheatgrass control is Plateau© (imazapic). Application at low concentrations (3 6 oz/acre) during fall/early winter will minimize damage to native species. Adjuvants (e.g., surfactant, drift control agents, de-foaming agents) will be required for all weed treatments.
- 3. Roadside and small infestations will be treated by backpack spraying or truck/ATV mounted sprayer. Non-native invasive species control within interior of fire area will be treated using fixed-wing or rotary aircraft services
- 4. Winds in the area to be sprayed should be less than 10 MPH (constant).
- 5. A buffer of 100 feet will be adhered to around all private land areas. Herbicides approved for aquatic use will be used in riparian wetland areas according to labeled specifications
- 6. Applicator will be state certified. All aircraft used should be OAS certified; will be equipped with GPS guidance systems and contractor will be licensed and bonded.
- 7. Locate, map, and document (using photography, topographic maps, and Global Positioning System—GPS—technology), new weed occurrences within burned area. Provide GPS shapefile to aerial contractors for use in GPS guided applications. Document percent control or kill of noxious weeds.
- D. Purpose of Treatment Specifications: Protect the ecological integrity and site productivity of shrub-steppe plant communities and riparian areas within the Columbia NWR in accordance with established management plan guidelines.
- E. Treatment Effectiveness Monitoring Proposed: Spot checking of noxious weed sites to ensure control methods are meeting management objectives. A staff person from the Mid-Columbia River NWR Complex will visit sites controlled every week after initial treatment; this is especially important for weed populations that are sprayed to ensure effectiveness of herbicide application. If both spring and summer/fall applications are used then visits will occur during both these times.

LABOR, MATERIALS AND OTHER COST:

| PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below). | COST / ITEM |
|---|-------------|
| Maintenance Laborers (2) x \$30/hour x 80 hours per treatment x 3 treatment periods x 1 year | 14,400.00 |
| (Backpack spraying work) | |
| Wildlife Biologist (GS-12) x \$39/hour x 80 hours per treatment x 3 treatment monitoring periods x 1 year – treatment monitoring | 9,360.00 |
| TOTAL PERSONNEL SERVICE COST | 23,760.00 |
| EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting. | COST / ITEM |
| Misc. Spray nozzles, hoses, backpack sprayer, equipment repair | 1,000.00 |
| TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST | 1,000.00 |

| MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item): | COST / ITEM |
|---|-------------|
| 2,4-D Amine - 25 gallons (2 pt/ac x100 acres) @ \$9.50/gallon | 237.00 |
| Roundup Pro - 32 gallons (2.5 pt/ac x100 acres) @ \$32.00/gallon | 1,024.00 |
| Plateau – 38 gallons (6 oz/acre x 810 acres) @ \$277/gallon | 10,526.00 |
| MSO or MVO Surfactant – 48 gallons @ \$ 16.00/gallon | 768.00 |
| Biological Control Agents- Russian Thistle, diffuse knapweed | 1,200.00 |
| TOTAL MATERIALS AND SUPPLY COST | 13,755.00 |

| TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item): | COST / ITEM |
|--|-------------|
| 4 X 4 Pickup @ .485/mile x 200 miles/day x 24 days x 1 fiscal year | 2,328.00 |
| TOTAL TRAVEL COST | 2,328.00 |
| CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item): | COST / ITEM |
| Aerial Application of Herbicide-705 acres X \$30/acre | 21,150.00 |
| | |

SPECIFICATION COST SUMMARY

| FISCAL YEAR | PLANNED INITIATION DATE (M/D/YYYY | PLANNED COMPLETION DATE (M/D/YYYY) | WORK AGENT | UNITS | UNIT COST | PLANNED ACCOMPL ISHMENTS | PLANNED COST |
|----------------|--------------------------------------|---------------------------------------|---------------|-------|--------------|--------------------------------|-----------------|
| FY08 | 10/01/2007 | 9/30/2008 | S | Acres | 87.93 | 705 | 61,993.00 |
| | | | | | | TOTAL | 61,993.00 |

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

| 1. | Estimate obtained from 2-3 independent contractual sources. | |
|----|---|-------|
| 2. | Documented cost figures from similar project work obtained from local agency sources. | C,E |
| 3. | Estimate supported by cost guides from independent sources or other federal agencies | M |
| 4. | Estimates based upon government wage rates and material cost. | M,P,T |
| 5. | No cost estimate required - cost charged to Fire Suppression Account | |

 $[\]mathbf{P} = \text{Personnel Services}, \quad \mathbf{E} = \text{Equipment} \quad \mathbf{M} = \text{Materials/Supplies}, \quad \mathbf{T} = \text{Travel}, \quad \mathbf{C} = \text{Contract}, \quad \mathbf{F} = \text{Suppression}$

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

Vegetation and Soils Damage Assessment and Wildlife Damage Assessment, Appendix I.

TOTAL COST BY JURSIDICTION

| JURISDICTION | UNITS TREATED | COST |
|--|---------------|-------------|
| US Fish and Wildlife Service, Mid-Columbia River Refuges Complex, Columbia NWR | 705 acres | 61,993.00 |
| | | |
| | | |
| | TOTAL COST | \$61,993.00 |

PART F - INDIVIDUAL SPECIFICATION

| TREATMENT/ACTIVITY NAME | l Ecological Stabilization- Native Seeding | PART E SPECIFICATION # | 3 |
|---------------------------------|--|----------------------------------|--|
| NFPORS TREATMENT CATEGORY* | Invasive Species | FISCAL YEAR(S) (list each year): | 2007, 2008 |
| NFPORS TREATMENT TYPE * | Prevention/Seeding | WUI? Y/N | N |
| IMPACTED COMMUNITIES AT RISK | Shrub-steppe | IMPACTED T&E SPECIES | Washington ground squirrel (Candidate), Ferruginous hawk (Species of concern) |

^{*} See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

- A. General Description: This treatment activity will stabilize soil to prevent loss or degradation of productivity using seeding to prevent establishment of invasive plants within the burned area. Apply native seed mix through drill seeding, aerial, and ATV broadcast applications in the burned area to stabilize ecological integrity of native shrub steppe community, prevent invasion by noxious weeds and non-native species, and to limit erosion and stabilize soils.
- B. Location/(Suitable) Sites: The Upper Goose Fire area is located in Marsh Unit II on Columbia Refuge. Reseeding should take place across the portions of the fire area (410 acres drill seed and 295 acres aerial and ATV broadcast) that were critical shrub-steppe habitat areas to stabilize soils, limit weed invasion, and promote ecological integrity.

Design/Construction Specifications:

1. Purchase native seed mix: in appropriate amounts to stabilize soils and ecological function according to the following specifications for native seed mix.

Grasses

Needle and thread grass (Stipa comata)0.2 lbs/acreSandberg's bluegrass (Poa sandbergii) (Hanford)2 lbs./ac. PLSBottlebrush squirreltail (Elymus elymoides)1.5 lbs./ac PLSBluebunch wheatgrass (Pseudoroegneria spicata)4 lbs./ac PLS

Sand dropseed

Shrubs

Wyoming Big Sagebrush (Artemisia tridentate ssp. wyomingensis) 0.1 lbs/ac PLS

- 2. Seed Mixture Selection and Certification: The seed mix should be tested for purity and germination rates. Before accepting delivery of seed shipment the contractor must provide written evidence (seed label and letter) to the Mid-Columbia Refuge (Deputy Project Leader or Natural Resources Specialist) that the seed conforms to the purity and germination requirements in the specification. Seed must also be source identified as to its origin. Columbia Basin derived and grown seed is required, where practical, for all native grass, forb and sagebrush species.
- 3. Delivery: Deliver certified weed-free seed sold on pure live seed basis. Deliver to Mid-Columbia Refuge.

 Storage: Seed should be applied as soon as possible after delivery. If immediate application is not possible the seed should be stored under dry, cool conditions and protected from rodents and other wildlife. Seed also needs to be protected from dew and rain.
- 4. Timing of Seeding Application: Seeding should occur in December, 2007, or no later than late January, 2008. Application Rate: Seed will be applied at the above rates, on a PLS/acre basis.
- 5. Application Method: Seed will be applied by aerial contract services for broadcast seed operations. Broadcast seeding will be conducted by fixed-wing aircraft. Aircraft should be OAS certified; will contain GPS guided navigational systems for accurate seed placement to coordinates provided by the USFWS; contractor must be bonded.

Drill Seeding-Approximately 410-acres of the Upper Goose fire will be seeded with a rangeland drill on loamy, fine sand, soils on the eastern portions of the fire. Drill seeding operations will be conducted at ½ the aerial application rate.

- D. Purpose of Treatment Specifications: To stabilize soil to prevent loss or degradation of productivity. Seeding to prevent establishment of invasive plants, and direct treatment of invasive plants.
- E. Treatment Effectiveness Monitoring Proposed: Monitor to determine effectiveness.

LABOR, MATERIALS AND OTHER COST:

| PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below). | COST / ITEM |
|---|-------------|
| Wildlife Biologist (2) each (GS-12) @ \$39/hr X 220 Hours X 1 Fiscal year | 17,160.00 |
| Maintenance Personnel (2) x \$30/hour x 55-hours x 4-weeks (Drill seeding operations) | 13,200.00 |
| TOTAL PERSONNEL SERVICE COST | 30,360.00 |
| EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting. | COST / ITEM |
| Rangeland drill seeders (2), Rental @ \$12/acre x 410- acres plus mobilization \$2,000.00 | 11,840.00 |
| TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST | 11,840.00 |
| MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item): | COST / ITEM |
| Native seed mix @ \$250.68/ac x 400-aerial seed acres & 410-drill seed acres at ½ PLS rate (!205-acres full rate) | 151,661.40 |
| Cultipack rings, bearings, grease, oil, fuel (drill seeding operations); Backpack, sprayer, nozzle, equipment trailer plus \$2,000 | |
| TOTAL MATERIALS AND SUPPLY COST | 153,661.40 |
| TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item): | COST / ITEM |
| 4x4 Truck @ .485/mile x 100=miles/day x 22-days | 1,067.00 |
| TOTAL TRAVEL COST | 1,067.00 |
| CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item): | COST / ITEM |
| Aerial Broadcast Seeding –Fixed Wing Aircraft \$36/ac x 810- acres plus mobilization cost \$2,000 | 31,160.00 |
| Effectiveness monitoring. Contract, (1) scientist @ \$50/hour X 5 weeks spring (200 hours) and 5 weeks fall (200 hours) | |
| TOTAL CONTRACT COST | 51,160.00 |

SPECIFICATION COST SUMMARY

| FISCAL YEAR | PLANNED INITIATION DATE (M/D/YYYY | PLANNED COMPLETION DATE (M/D/YYYY) | WORK AGENT | UNITS | UNIT COST | PLANNED ACCOMPL ISHMENTS | PLANNED COST |
|----------------|--------------------------------------|---------------------------------------|---------------|-------|--------------|--------------------------------|-----------------|
| FY08 | 10/01/2007 | 07/23/2008 | S | Acres | 351.90 | 705 | 248,088.40 |
| | | | | | | TOTAL | 248,088.40 |

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

| 1. | Estimate obtained from 2-3 independent contractual sources. | |
|----|---|-------|
| 2. | Documented cost figures from similar project work obtained from local agency sources. | C,E |
| 3. | Estimate supported by cost guides from independent sources or other federal agencies | M |
| 4. | Estimates based upon government wage rates and material cost. | M,P,T |
| 5. | No cost estimate required - cost charged to Fire Suppression Account | |

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

Please refer to Vegetation and Wildlife Assessments- Appendix I; Maps - Appendix III.

TOTAL COST BY JURSIDICTION

| JURISDICTION | UNITS TREATED | COST |
|--|---------------|--------------|
| US Fish and Wildlife Service, Mid-Columbia River Refuges Complex, Columbia NWR | 705 acres | 248,088.40 |
| | | |
| | | |
| | TOTAL COST | \$248,088.40 |

PART F - INDIVIDUAL SPECIFICATION

| TREATMENT/ACTIVITY NAME | Lemargancy Stabilization Plan Davelonment | PART E SPECIFICATION # | 4 |
|---------------------------------|---|----------------------------------|---|
| NFPORS TREATMENT CATEGORY* | Planning | FISCAL YEAR(S) (list each year): | 2007 |
| NFPORS TREATMENT TYPE * | BAER/ES Plan | WUI? Y/N | N |
| IMPACTED COMMUNITIES AT RISK | | IMPACTED T&E SPECIES | Sage Sparrow, Townsend's Ground Squirrel, Ferruginous Hawk, White-Tailed Jack Rabbit, Greater Sage Grouse |

^{*} See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

- A. General Description: Prepare the Emergency Stabilization (ES) plan for the Upper Goose on the Mid-Columbia River Refuge.
- B. Location/(Suitable) Sites: Plan has been prepared to address all land under jurisdiction of U.S. Fish and Wildlife Service within the Upper Goose Fire area. Plan costs include administrative costs, salaries of planning team, and supplies.
- C. Design/Construction Specifications:
- 1. Conduct a detailed assessment of burn severity, its impacts to lands and the threats to life and property; protect critical cultural and natural resources.
- 2. Write specifications based on assessment recommendations.
- 3. Submit plan for approval and secure funding from appropriate sources.
- 4. Per policy, complete annual reports with monitoring narratives and cost details.
- D. Purpose of Treatment Specifications: To prepare a comprehensive ES Plan to manage or mitigate the fire impacts in order to protect life, property and critical cultural and natural resources.
- E. Treatment Effectiveness Monitoring Proposed: Per policy, an annual and final accomplishment report will be prepared with detailed costs and monitoring narratives and will be completed within 7 days of fire containment (DM 620, Chapter 3).

LABOR, MATERIALS AND OTHER COST:

| PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below). | |
|--|-----------|
| TOTAL PERSONNEL SERVICE COST | |
| EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting. TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST | |
| MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item): | |
| FWS Assistance and Reports | |
| TOTAL MATERIALS AND SUPPLY COST | 5,000.00 |
| TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item): | |
| TOTAL TRAVEL COST | |
| CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item): | |
| Contractor Price | 27,400.00 |
| TOTAL CONTRACT COST | 27,400.00 |

SPECIFICATION COST SUMMARY

| FISCAL YEAR | PLANNED INITIATION DATE (M/D/YYYY) | PLANNED COMPLETION DATE (M/D/YYYY) | WORK AGENT | UNITS | UNIT COST | PLANNED ACCOMPL ISHMENTS | PLANNED COST |
|----------------|---------------------------------------|---------------------------------------|---------------|-------|--------------|--------------------------------|-----------------|
| FY07_ | 7/16/2007 | 10/15/2007 | P | 1 | | 1 | 32,400.00 |
| | | | | | | TOTAL | 32,400.00 |

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

| 1. | Estimate obtained from 2-3 independent contractual sources. | M |
|----|---|---|
| 2. | Documented cost figures from similar project work obtained from local agency sources. | |
| 3. | Estimate supported by cost guides from independent sources or other federal agencies | |
| 4. | Estimates based upon government wage rates and material cost. | Р |
| 5. | No cost estimate required - cost charged to Fire Suppression Account | |

 $[\]mathbf{P}$ = Personnel Services, \mathbf{E} = Equipment \mathbf{M} = Materials/Supplies, \mathbf{T} = Travel, \mathbf{C} = Contract, \mathbf{F} = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

| JURISDICTION | UNITS TREATED | COST |
|--|------------------|-----------|
| U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Hanford Reach National Monument | 1 | 32,400.00 |
| | | |
| | | |
| | TOTAL COST | 32,400.00 |

TOTAL COST BY JURSIDICTION

PART G - POST-EMERGENCY STABILIZATION REQUIREMENT (Upper Goose fire)

The following are post-emergency stabilization, implementation, operation, maintenance, monitoring, and evaluation actions after three years from the control of the fire to ensure the effectiveness of initial investments. Estimated annual cost and funding source is indicated.

- 1. Maintain service roads (grading, spraying, mowing) (\$ 1,200 1262)
- 2. Maintain fire breaks (\$1,000 -9131)
- 3. Maintain fences and signs (\$1,200 1262)
- 4. Continue annual invasive species monitoring and control (\$5,000 1261)
- 5. Re-visit and re-take photo monitoring points (GS-09 Wildlife biologist, 16 hours = \$328 1261)
- 6. Monitor native planting (GS-09 Wildlife Biologist, 20 hours = \$410 1261)
- 7. Provide education and interpretation of restoration area (GS-11 Outdoor recreation planner, 2 tours annually, 20 hours = \$510 1263)
- 8. Wildlife Resource monitoring/sensitive species surveys (GS-11 Wildife Biologist, 80 hours = \$2,040 -1261)
- 9. Produce publications and reports and coordinate University research related to fire ecology (GS-12 Research biologist, 40 hours annually = \$1,200 -1261)
- 10. Cultural Resource protection, Law enforcement Officer (GS-9 LE officer, regular patrols once a quarter annually = 32 hours = \$816 1264)
- 11. Continue non-native tree removal, pile and burning (Fire management, fuels reduction, \$800 9131)
- 12. Monitor native grass seeding and natural recovery of forbs. (GS-09 Wildlife biologist, 16 hours = \$328 1261)

PART H - CONSULTATIONS

Please see Appendix I, Assessments

APPENDIX I - BURNED AREA ASSESSMENT REPORTS

BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE- MID-COLUMBIA RIVER NATIONAL WILDLIFE REFUGE COMPLEX

RESOURCE ASSESSMENTS

- CULTURAL RESOURCE DAMAGE ASSESSMENT
- VEGETATION AND SOILS RESOURCE DAMAGE ASSESSMENT
- WILDLIFE RESOURCE DAMAGE ASSESSMENT
- OPERATIONS RESOURCE ASSESSMENT
- WATERSHED AND SOIL DAMAGE ASSESSMENT
- WETLAND AND RIPARIAN RESOURCE ASSESSMENT



BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE CULTURAL RESOURCE DAMAGE ASSESSMENT

I. OBJECTIVES

- Assess damages to known historic and prehistoric cultural resources as the result of fire behavior.
- Assess potential risks to known/documented cultural resources as the result of the fire (e.g. erosion, flooding and exposure to looting and/or vandalism).
- Assess potential risks to known cultural resources as the result of emergency stabilization activities.
- Coordinate with Federally recognized Tribes.

II. ISSUES

- Identify known/documented resources that have been subject to direct or indirect effects of fire and fire suppression actions.
- Identify emergency stabilization and/or protection needs for cultural resources within the fire.
- Other resources stabilization measures that may put cultural resources at risk.
- Consultation with appropriate parties to meet legal compliance and tribal consultation.

III. OBSERVATIONS

A. Background

The Upper Goose Fire, fire number 13580-9141-DQJ1 was reported at approximately 1330 on July 13, 2007. The Upper Goose Fire demonstrated extreme fire intensity on about 65% of the burned area as it was pushed through the shrub-steppe community by gusting and fire generated convective winds. The remaining 35% was consumed by a moderately intense backing fire. Total acres burned for this fire were 2,258 with 705 of those acres being on USFWS managed land.

Although several small scaled Section 106 compliance surveys have been completed for the Mid-Columbia NWR Complex, very few historic and prehistoric sites have been recorded within its boundaries. The sites that have been identified include open air sites with possible house pit depressions, rock shelters/features, and an abandoned homestead site with only remnants of the concrete foundation.

The earliest archaeological investigations in the general vicinity of the refuge were completed by Richard Daugherty in 1952 during the construction of the Potholes Reservoir, which is located approximately 3 miles north of the northernmost perimeter of the Upper Goose Fire area. As a result, four house pit depressions of proto-historic age were excavated. In 1956, Daugherty's investigations at Lind Coulee (immediately east

of Potholes Reservoir) revealed an important archaeological site that demonstrated prehistoric occupation in the Columbia Basin. The Lind Coulee site is on the National Register of Historic Places and remains as one of the few early period sites to have been found and excavated in an upland setting. In closer proximity to the refuge, Irwin and Green (1973) conducted an archaeological survey along Lower Crab Creek for a Bureau of Reclamation water disposal route project under contract with the National Park Service. The survey focused on both sides of Lower Crab Creek, which meanders in and out of the refuge boundaries. Of the 21 archaeological sites they identified and recorded (mostly open air sites with possible house pit depressions and a few rock shelters), four sites appear to be within the boundaries of the refuge. They also noted that amateur looting activities had destroyed many of the potentially valuable sites in the area.

The prehistoric cultural chronology for the Mid-Columbia NWR Complex is based on information related to the nearby Hanford site, taken from the *National Register of Historic Places Multiple Property Documentation Form – Historic, Archaeological and Traditional Cultural Properties of the Hanford Site, Washington* (U.S. Department of Energy 1997). The chronology summary states:

The prehistoric Columbia Plateau region has been impacted by basalt flows, catastrophic flooding, and environmental change which have meant that prehistoric regional inhabitants adapted their cultural subsistence systems as necessary to survive. The moist, cool conditions of the early Holocene meant that early peoples [12-15,000 B.P. to 8,000 years B.P.] were probably mobile, taking advantage of available resources in an organized fashion.

As the environment became drier after 8,000 years B.P., it is likely that the descendants of these early people developed a more mobile, generalized riverine-based economy. The arrival of a moist and cool environment at approximately 4,500 years B.P. was coupled with year-round residency and a hunter-gatherer subsistence pattern which was modified briefly at 3,800 years B.P.

Approximately four-hundred years later, circa 3,400 years B.P., the climate cooled once again but the sedentary lifestyle did not return to the study area until 3,000 years B.P. After this point, populations increased along the rivers as groups focused on salmon, roots and ungulates. A significant increase in storage and food processing activities were common to many people throughout the Columbia Basin although the mobility of the hunter-gatherer lifestyle remained a strong component into the ethnographic period (1997:2-1).

The Upper Goose Fire occurred primarily in shrub-steppe uplands, which are not considered high probability as this area did not afford the requisite resources for permanent settlement. The portion of the Upper Goose Fire that occurred adjacent to Lower Crab Creek, however, is considered to be high probability for the presence of potentially significant and previously unrecorded archaeological sites.

The Ethnographic/Contact Period (1805-1943) extends from the time of first Euroamerican contact to when Native Americans were excluded from settlement and/or use of the area. This period reflects both a continuity of earlier, pre-Contact lifeways and subsequent changes to Euroamerican building styles and incorporation of Euroamerican materials. During this period, Native groups ceded lands and were, for the most part, moved onto reservations. At the present time, the Federally-recognized Confederated Tribes of the Umatilla Indian Reservation, Yakama Indian Nation, Confederated Tribes of the Colville Indian Reservation, Nez Perce Tribe and the non Federally-recognized Wanapum have expressed interest in this area (U.S. Department of Energy 1997:3.4-3.35).

The Historic Period began with the passage of the Lewis and Clark expedition (1805-1806) near the area. Subsequent to this was the passage of missionaries, mining, ranching, establishment of trading posts, river travel and community development (U.S. Department of Energy 1997:4.6-4.21). With the possibility of grazing and limited homestead use, the area within the Upper Goose Fire appears to have been bypassed by historic development in favor of other locations with better access to water.

B. Methodology and Results

The USFWS Cultural Resources Team (CRT) conducted a record search of maps and site forms on file at the CRT office for the area encompassed by the Upper Goose Fire on August 13, 2007. A records search at the Washington State Department of Archaeology and Historic Preservation was also conducted on August 14, 2007. In addition, an analysis of the potential effects of the fire on cultural resources was conducted. It was determined that fire suppression activities such as the excavation of the fire dozer line and the damage of the two-track road from vehicular traffic may have disturbed or displaced elements of unrecorded cultural resources.

Prehistoric Sites

The record search and map analysis determined that there were no previously recorded prehistoric or historic sites in or adjacent to the Upper Goose Fire area.

It is recommended that the portion of the fire that occurred on the refuge be surveyed for the presence of previously unreported prehistoric sites. The fire may have made such sites more visible by removing vegetation.

Historic Sites

The record search and map analysis determined that there were no previously recorded prehistoric or historic sites in or adjacent to the Upper Goose Fire area.

Additional Risks

There are no known significant prehistoric or historic sites within the Upper Goose Fire area. However, the two-track road that was severely damaged from vehicular traffic during fire related activities may have exposed previously unreported cultural resources.

Ground inspections are recommended to document the locations and appearance of (or, lack thereof) of previously unrecorded historic sites and artifacts.

IV. RECOMMENDATIONS

A. Emergency Stabilization – Fire Suppression Repair

It is recommended that fire lines and other areas where activities associated with fire suppression be surveyed for the presence of previously unreported sites. If any sites were affected, it is recommended that these sites be evaluated for eligibility to the National Register of Historic Places. If it is determined that any site(s) is eligible, then stabilization and/or mitigation measures should be developed in consultation with the Washington State Historic Preservation Office and appropriate tribes.

B. Emergency Stabilization

The following recommendations supported by specifications are offered to protect cultural resources impacted by the Upper Goose Fire:

#1. Conduct cultural resources compliance prior to implementation of any emergency stabilization treatments.

C. Rehabilitation

No rehabilitation specifications specific to cultural resources are advanced at this time. However, field visits will be conducted subsequent to the submission of this plan and rehabilitation specifications submitted with the Upper Goose Fire rehabilitation plan.

D. Management Recommendations – Non-Specification Related

If ground-disturbing activities or treatments are proposed for other resources under emergency stabilization, Section 106 clearance, including appropriate tribal consultation, should be included in that specification.

V. CONSULTATIONS

WA-SHPO – Archaeologist Jorie Clark initiated contact with the Washington State Historic Preservation Office via e-mail on August 16, 2007 that Section 106 NHPA procedures will be followed for any treatments that may affect cultural resources.

Confederated Tribes of the Umatilla Indian Reservation - Archaeologist Jorie Clark initiated contact on August 16, 2007.

Yakama Indian Nation – Archaeologist Jorie Clark initiated contact on August 16, 2007.

Confederated Tribes of the Colville Indian Reservation – Archaeologist Jorie Clark initiated contact on August 16, 2007.

Nez Perce Tribe – Archaeologist Jorie Clark initiated contact on August 16, 2007.

Wanapum Tribe – Archaeologist Jorie Clark initiated contact on August 16, 2007.

VI. REFERENCES

Daugherty, R.D.

1952 Archaeological investigations in O'Sullivan Reservoir, Grant County, WA. American Antiquity 17:374-383.

Greene, G.S. and Irwin, T.T.

1973 An Archaeological Survey of Lower Crab Creek. Unpublished manuscript. Laboratory of Anthropology, Washington State University, Pullman. Report on file at the Cultural Resource Team Office, U.S. Fish and Wildlife Service, Sherwood, OR.

United States Department of Energy.

1997 National Register of Historic Places Multiple Property Documentation Form – Historic, Archaeological and Traditional Cultural Properties of the Hanford Site, Washington. February 1997.

Jorie Clark, U.S. Fish and Wildlife Service, Cultural Resources Division, Region 1, Sherwood, OR (503) 625-4377

BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE VEGETATION RESOURCE ASSESSMENT

I. OBJECTIVES

- Evaluate and assess Fire and suppression impacts to vegetation resources and identify values at risk associated with vegetation losses.
- Determine emergency stabilization and monitoring needs supported by specifications to aid in vegetation recovery and soil stabilization.
- Evaluate the potential for invasive species encroachment into native plant communities within the Fire area.
- Provide management recommendations to assist in vegetation recovery, watershed stabilization, site productivity and species habitat protection.

II. ISSUES

- Protection of resource values including site productivity, wildlife habitat, vegetation resources, cultural resources and watershed stability.
- Management strategies which provide for the stabilization, natural regeneration and recovery of impacted areas.
- Immediate stabilization of denuded (i.e. vegetation has been removed) soils that may impact ecological function
- Monitoring of the planting/seeding effectiveness of emergency stabilization efforts.
- Monitoring of impacted lands for the early detection and control of invasive and noxious weed species.

III. OBSERVATIONS

A. Background Information

This report identifies and addresses known and potential impacts to vegetation resources within the Upper Goose Fire area on the Columbia National Wildlife Refuge (Refuge). The Fire started on July 13, 2007 and burned 705 acres of contiguous area. The vegetation resources are described as upland Columbia Basin shrub-steppe plant communities. Findings and recommendations contained within this assessment are based upon field reconnaissance of the Fire area, interviews with local resource specialists, local land managers, and review of relevant documents.

This report will refer to plants in communities and also in associations. A plant community is an assembly of different species of plants growing together in a particular habitat and plant associations are a distinctive community of plants that have ecologically similar requirement.

Vegetation occurring prior to the Upper Goose Fire consisted of the big sagebrush (Artemisia tridentata) community, elements of which include Sandberg's bluegrass (Poa sandbergii), bluebunch wheatgrass (Pseudoroegneria spicata)), Idaho fescue (Festuca idahoensis), greasewood (Sarcobatus vermiculatus), saltgrass (Distichilis stricta), rabbitbrush (Chrysothamnus spp.), and yarrow (Achillea millefolium). Due to previous fires, much of the big sagebrush in the refuge had not become reestablished. In the areas with loamy soils, big sagebrush was the most dense and healthiest stands of any area on the refuge. All the mature big sagebrush left intact from the 1992 Goose Lake Fire was completely destroyed in the Upper Goose Fire, leaving no stands for future seed generation. Predominant over the native species in some areas was cheatgrass (Bromus tectorum), a non-native annual that contributed to the Fire's rapid spread and high fire intensity.

Much of the vegetative resources that were extensively impacted on federal land by this fire are considered high-quality or sensitive vegetation suitable for wildlife forage and when intact, offers quality soil stabilization. Findings and recommendations contained within this stabilization plan are based upon field reconnaissance of the burned area, interviews with local resource specialists, local land managers, and review of relevant documents and literature. This report will detail the known damage to the vegetation and soil resources, will discuss re-vegetation processes and future monitoring criteria, and will outline management considerations for recovery of vegetation resources.

B. Reconnaissance Methodology

Ground reconnaissance was conducted on July 14, and August 1, 2007 by U.S. Fish and Wildlife Service (USFWS) staff member Randy Hill and on September 6, 2007 by First Strike/Shaw Environmental BAER Team Members. Photographs were taken on July 14, 2007, August 1, 2007, and September 6, 2007 which are in the photo documentation section of this plan (Appendix IV).

Plant associations were inspected to determine losses, requirements for stabilization efforts, and recovery potentials. Observations were made of fire impacts to duff layers and live crown tissue on grass and shrub species. Direct fire impacts have been documented for all plant communities, based upon consultation with local staff, and after reviewing the burned areas within the Fire perimeter through visual assessment, photos, and map documentation.

C. Findings

1. Vegetation:

The big sagebrush/bluebunch wheatgrass association is characterized by four layers of vegetation: an overstory layer composed mostly of big sagebrush up to two meters tall, a tall understory layer of bluebunch wheatgrass, a short understory dominated by Sandberg's bluegrass, some remnant Idaho fescue and a layer of algae, liverworts, lichens and mosses. This diminutive biologic community stabilizes the soils and fills the

interstitial space between bunchgrass clumps. Perennial forbs are a minor constituent of the tall understory layer, whereas most annual forbs occur in the short understory layer. Other shrubs that may be present include rabbitbrush and black greasewood. Additional plants include yarrow and Thurbur's needlegrass (Achnatherum thurberianum).

Plant associations within the Upper Goose Fire include big sagebrush/bluebunch wheatgrass/Sandberg's bluegrass/cheatgrass, black greasewood/saltgrass and abandoned agricultural fields dominated by forbs and annual grass communities. Topography, aspect, and elevation dictate the variability of the vegetative communities within the Fire area as well as the soil textures and depths of rooting capability.

The Upper Goose Fire burned approximately 2,258 acres, of which 705 acres were on refuge lands. (See Appendix III, Maps)

Primary plant communities impacted by the Fire included the following plant associations:

<u>Big sagebrush/Sandberg's bluegrass/Bluebunch wheatgrass:</u> Sagebrush is the dominant shrub, although rabbitbrush occurs at varying levels, as well as greasewood, in the low lying areas. Sandberg's bluegrass, mixed with bluebunch wheatgrass dominates the understory.

<u>Big sagebrush/Sandberg's bluegrass/Bluebunch wheatgrass/Cheatgrass:</u> Sagebrush is the dominant shrub, although rabbitbrush occurs at varying levels as well as greasewood in the low lying areas. Sandberg's Bluegrass mixed with bluebunch wheatgrass dominates the understory, interspersed with varying levels of cheatgrass. While they often commingle, Sandberg's Bluegrass and cheatgrass are frequently ecologically-separated on a fine scale (Easterly, R. and D. Salstrom 2004.), with Sandberg's bluegrass dominant over cheatgrass in the slightly-depressed intershrub areas and other areas with specific microclimates with slightly-higher moisture (e.g., in specific micro-topographic areas).

<u>Black greasewood/saltgrass:</u> This plant community is composed of greasewood and saltgrass and can be found in the low-lying areas that retain moisture; these areas are too moist for the big sage community.

Species diversity within each of the major community types has been altered in some areas due to the activities of neo-European people that entered the region beginning 200 years ago. In more recent history, alien plants were introduced and established a foot-hold in the shrub-steppe communities, with the advent of livestock grazing in the mid-1800's and through agricultural cultivation and urbanization later in the century.

Vegetation within this area has also been altered through the establishment of cheatgrass within sage communities and the shortening of the natural fire return interval. Pre-Neo Human contact, fire return intervals were between 50 and 100 years

in the shrub-steppe region. Fires burned in a mosaic fashion across the landscape, leaving many healthy remnant stands of bunchgrass and sage. The mosaic fire patterns allowed for the survival of healthy sage communities and habitat for wildlife species. The shortened fire return interval has created impacts from repeated burning.

2. Rare Plants

There has been no survey work to account for rare species within the confines of the Upper Goose Fire area. For this reason, the current U.S. Fish and Wildlife Service species list for Grant County was consulted. A Species list was obtained using the following web-based address:

http://www.fws.gov/easternwashington/county%20species%20lists.htm.

Listed plant species that have occurrences within Grant County include:

| SPECIES | <u>LISTING STATUS</u> |
|--|-----------------------|
| Gray cryptantha (Cryptantha leucophaea) Hoover's desert-parsley (Lomatium tuberosum) Northern wormwood (Artemisia campestris ssp. borealis var. wormskoldii) Ute ladies' tresses (Spiranthes diluvialis) Wanapum crazyweed (Oxytropis campestris var. wanapum) | FSC FSC C T |
| | |

KEY TO LISTING STATUS:

- T FEDERAL THREATENED
 C FEDERAL CANDIDATE
- FSC FEDERAL SPECIES OF CONCERN

The above-listed species were identified as occurring, or having habitat within Grant County. However, through post-fire reconnaissance and consultation with local experts, it was determined that these species were not affected by the Fire because they have no habitat within or adjacent to the Fire area, or inventories prior to the Fire determined absence, and/or the Fire is outside of the species range.

3. Vegetation/Structural Impacts

Vegetation resources were directly impacted by the Upper Goose Fire and by suppression tactics utilized to control the Fire. Documented impacts to vegetation resulted from:

a) Potential for invasion by aggressive non-native species throughout the disturbed site.

- b) Impacts to native shrub and grass species during suppression and mop-up activities.
- c) Vegetation losses due to fire intensity. Most sagebrush and grassland communities were completely consumed and/or scorched. Some additional loss is expected within the remaining shrub communities.
- d) Loss of the organic litter layer on approximately 95 percent of the Fire area.

Fire effects were varied, but were mostly low to medium in intensity. Afternoon wind-driven flames moved quickly across small areas before being slowed by canyon walls. Much of the Fire moved slowly through a large part of the burned area as humidity rose and winds diminished toward the evening and overnight. From positions north of Upper Goose Lake and south of Marsh Unit 3 multiple slow steady flame fronts crept up hills and through canyons. This increased residence time was likely responsible for complete combustion of shrubs that survived past fires. Notable were the lack of shrub "skeletons", and the destruction of remaining sagebrush not surrounded by ground fuels that were even moderate in some areas. Shrubs that had persisted at the base of cliffs and rock outcrops were mostly consumed. Sandberg's bluegrass was widespread, but most areas were dominated by cheatgrass due to grazing history and past fires. Shrubs generally burned to the ground except at the east end near Morgan Lake Road, with few skeletons or stumps, and only white ash to indicate very hot and complete combustion (Hill 2007) (See Appendix IV, Photo Documentation)

Most sagebrush, bunchgrass, and cheatgrass communities experienced greater than 90 to 95 percent vegetation loss of above-ground cover. It was observed that approximately 70 to 85 percent of the Upper Goose Fire area completely consumed all vegetation resources. This estimate excludes a large plateau that was not burned, but remains within boundary of the Fire perimeter. The area burned by the Upper Goose Fire had previously been burned in 1992; this prior fire limited the vegetative coverage, including high densities of sagebrush. The current fire burned or scorched the remaining mature sagebrush, leaving no seed source for future regeneration.

| Fire Severity | Percent Affected |
|---------------|------------------|
| Low | 40 |
| Medium | 45 |
| High | 15 |

| Breakdown of Area | Percent Affected |
|-------------------------------------|------------------|
| Total percent burned | 70-85 |
| Total area affected by wind erosion | 30 |
| Total percent vegetation affected | 90-95 |

| Breakdown of Major Plants | Percent Affected | |
|---------------------------|------------------|--|
| Sage | 95-100 | |
| Bunchgrass | 90-95 | |
| Cheatgrass | 95-100 | |

Ground-disturbing impacts to Refuge property resulted from the vehicles driving off-road during suppression efforts. A complete inventory of ground disturbance was conducted on the Fire area and emergency stabilization needs were assessed (Please see Watershed and Soil Damage Assessment, Appendix I).

The role of microbiotic crusts (MBC) in shrub-steppe ecosystems is still incompletely understood (Evans and Lih 2005:106) and estimating the magnitude and extent of MBC damage from the Bobcat Fire is a complex task that is beyond the scope of BAER field survey and assessment. Therefore, this assessment can make no definitive conclusions about the areawide condition and location of the MBC and the emergency stabilization measures recommended reflect this finding.

B. Vegetation Recovery

Revegetation of the Fire area through natural processes will take between 7-30 years to visually represent pre-fire conditions. However, due to the presence of non-native plants and noxious weeds, the site is at risk of becoming dominated by non-native annuals, such as cheatgrass, aggressive annual/biennial species such as Russian thistle (Salsola L.), and aggressive perennial species such as Canada thistle (Cirsium arvense) and rush skeletonweed (Chondrilla juncea L). Without active restoration, it is unlikely that the site will recover to its pre-fire characteristics. Some impacted plant communities will take decades to re-establish back to pre-fire levels.

| Plant Expected Regeneration Perce | |
|-----------------------------------|-----|
| Sage | 0-2 |
| Bunchgrass | 60% |
| Cheatgrass | >90 |

1. Noxious Weed Establishment

Invasive non-native plant species pose one of the most serious threats to the native biodiversity, wildlife habitat, and scenic values of the Refuge. At the Refuge, and elsewhere in western North America, invasive and noxious non-native plant species compete against and reduce habitat available for rare plant taxa, and native plant species in general. Weeds alter ecosystem structure and function, disrupt food chains and other ecosystem characteristics vital to wildlife (including rare and endangered species), and can dramatically alter key ecosystem processes such as hydrology, productivity, nutrient cycling, and fire regime. Conditions created by wildfire favor the spread of many noxious weed species (Evans, J.R., J.J. Nugent, and J.K. Meisel, 2003).

The Fire presents a large-scale disturbance and created new open sites vulnerable to weed invasion, creating a fertile bed for the rapid colonization and spread of non-native species, especially coupled with the added nutrients from the ash. Thus, invasive species and noxious weeds which compete with the recovery of native vegetation are likely become established and/or spread within the burned area.

Control of weed species known on the Refuge was prioritized in the Weed Inventory and Management Plan (2003), based on the following criteria: aggressiveness, level/size of infestation, degree of ecological threat or impact, value of habitat surrounding weed infestations, and effectiveness of available control technologies. Priority 1 species that pose the greatest threat and require immediate control. Priority 2 species do not spread quite as rapidly as Priority 1 species, but are still of great concern. Priority 3 species are all other invasive species that are perceived as slightly less likely to threaten Monument resources, but are still of concern.

During post-fire reconnaissance and field assessment, wildlife biologists recorded sightings of any non-native or invasive species. In addition, known infestations of invasive species of concern that are located within and near the burned area and their priority for control are listed in the following table. Several of these species are located within the Fire area, and others are very near to the Fire area.

| | Priority for |
|--|--------------|
| Species | control |
| Cheatgrass (Bromus tectorum) | 1 |
| Diffuse knapweed (Centaurea diffusa) | 1 |
| Rush skeletonweed (Chondrilla juncea) | 1 |
| Puncturevine (Tribulus terrestris) | 1 |
| Russian knapweed (Acroptilon repens) | 2 |
| Canada thistle (Cirsium arvense) | 2 |
| Kochia (Kochia scoparia) | 3 |
| Perennial pepperweed (Lepidium latifolium) | 3 |

All of the above non-native plants and noxious weeds spread vigorously, and are a threat to the burned area. Each of these species is currently located along existing road systems and/or in areas within or near the Fire. It is imperative to treat known populations prior to seed-set to reduce the expansion potentials of these populations into the Fire area. Immediate treatment of these populations is recommended.

The Fire area presents a disturbance, and has created new open sites for weed invasion. Coupled with the added nutrients from the ash, a fertile bed for the rapid colonization and spread of non-native species has been created. Upon the discovery of new noxious weed populations, accurate population information should be collected through the use of Global Positioning Systems (GPS) to determine infestation size, original source, and potential control methods. Control efforts will be implemented in accordance with the Invasive Species Management Plan guidelines and protocols.

The area of the Fire may have further populations of noxious weeds that are currently un-documented. Immediate surveys of the area are important to document any previously unknown infestations.

The U.S. Fish and Wildlife Service uses an Integrated Pest Management (IPM) approach to treat targeted invasive plant species on the Refuge. Manual, mechanical, biological, cultural (e.g., prescribed fire and competitive plantings), and chemical treatment methods will be used within the Fire area to achieve prioritized weed control objectives. Invasive species managers will draw upon the full range of appropriate control technologies to develop integrated treatment plans for target species at selected priority sites. Treatment methodologies will be based upon the best information available from weed management literature and professional experience, tailored to the characteristics of the particular species and site.

2. Revegetation

Concern has been expressed over the loss of vegetation cover within the Upper Goose Fire area. Stabilization and re-vegetation of those areas is needed to ensure ecological function. Revegetation in the area should be conducted in order to protect soils in the area, to reduce the change due to further water erosion, wind erosion and degradation.

The former big sagebrush community is unlikely to develop quickly and this species in general does not re-sprout from roots, but must be reseeded. Natural seeding for the return of big sage are especially limited because of previous fire and 95 to 100 percent of sagebrush burn from this fire. Consequently, supplemental reseeding will have to be implemented at some point. Although 60 percent of the bunchgrass is predicted to resprout without further action, cheatgrass is likely to be the predominant pant invading the area. In addition, other exotics such as Russian thistle and diffuse knapweed are already establishing themselves in the area.

Although cheatgrass has limited benefits as green browse for wintering Canada geese, it is not as valuable or biologically-diverse a community as that of the big sage community. Because cheatgrass has the ability to establish itself earlier in the season than native species (it germinates at low temperatures to take advantage of late fall or early spring moisture), it is very effective at becoming the predominant vegetation of a burned area. Native species have difficulty in re-establishing once cheatgrass is established. The resulting monoculture weakens the natural biotic diversity of the native community. An herbicide spray of Plateau[®] should be used to control the spread of cheatgrass.

To promote the maintenance and reestablishment of the native communities and prevent the establishment of undesirable exotics, a reseeding program of native shrubs and grasses is essential. Seeding should ideally occur in the fall (just before snowfall, if possible), taking advantage of cool season precipitation for early spring germination. Because there is cheatgrass seed available on both burned and upwind areas, fall restoration seeding is imperative to prevent cheatgrass spread. Only seed certified as

weed-free would be purchased to further protect against the spread of undesirable exotic species.

Invasive broadleaf species (especially knapweeds) must be controlled, especially along tracks and roads used during the suppression effort. Where soil disturbance created openings in the cryptogam layer that normally holds the soil and protects the interspaces between plants, spot spraying of Escort[®], Telar[®], or 2,4-D and Banvel[®] is necessary to prevent the spread of these species in the burned area.

The rehabilitation plan for the Upper Goose Fire should be in accordance with the Refuge's land use and management objectives: to preserve, restore, and enhance natural ecosystems, to preserve the natural diversity of fauna and flora, and to provide visitors with a recreational experience oriented toward wildlife.

Application of herbicide and planting of native seeds (including aerial seeding) to restore areas before invasive species become established is well supported by recent research (Bakker & Wilson, 2004:1058-1064) (Huddleston & Young 2005:507-515) (Thompson & Rounding, 2006) (Seabloom & Harpole 2003).

Evans and Lih (2005) findings/conclusions support the recommended Bobcat Fire ES measures over natural recovery:

- --Careful management... and a long term commitment to integrated and adaptive approaches to invasive species management, fire management and restoration practives will be required to successfully manage the ALE Reserve and other shrubsteppe ecosystmes in the coming years.
- --Aggressive management activity to control cheatgrass and to enhance the recovery of natural structure and function of sagebrush shrubland stands will be critical to the long-term ecological integrity of these habitats.
- --The problem of cheatgrass must be addressed in relation to native plant community health and fire management practices. There are no simple answers; no permanent solution to the problem of cheatgrass control is currently available and management is extremely challenging.
- --The rates of grass seedling emergence and recruitment from aerial seeding efforts observed in the study are probably typical of broadcast seeding efforts in the arid West. (This infers that aerial seeding is a typical broadcast seeding practice in similar areas of the Western U.S).

IV. RECOMMENDATIONS

A. Fire Suppression Stabilization:

Suppression account – Dozer/Disk line Rehabilitation: Drill-seed all disturbed areas which resulted form suppression actions with native species to protect the ecological integrity of the area. Seeding and planting will be postponed until fall or until such time as adequate moisture provides a firm seedbed for stabilization actions.

B. Emergency Stabilization: (specification related)

The following recommendations are offered to assist in the timely recovery of the Upper Goose Fire:

Stabilize soil to prevent loss or degradation of productivity by seeding to prevent establishment of invasive plants; and by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area.

- 1) Non-Native Invasive Species Control: Pesticide Spray Followed With Native Plant Seeding- Apply pesticide spray to significantly reduce invasive weed spread and diminish threats in areas of concern from noxious weeds and nonnative species. Spray should not be applied during high winds. Follow the spray with aerial and drill seeding of native plants mix and in the fall to establish prolific native colonies and minimize invasive weed infestation into non-infested areas. Seeding methods should follow weather patterns to determine times of appropriate seeding considering expected moisture and wind.
- 2) Effectiveness Monitoring: Monitor non-native, invasive species growth and native plant seedlings in first year following treatment to determine success of revegetation efforts and to determine if additional treatments are required to protect and maintain the ecological integrity of the site.

C. Management Recommendations (non-specification related)

• Submit long-term rehabilitation plan as required, to stabilize soils, control nonnative invasive species, and protect ecological integrity of the site.

D. Management Recommendations (non-specification related)

 Monitoring: Invasive Plant Species- Develop monitoring protocols and conduct field inventories on disturbed sites, including but not limited to, dozer lines, hand lines, safety zones, and as discovered, initiate control measures on invasive species infestations that threaten native plant community recovery.

VI. References

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BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE WILDLIFE RESOURCE ASSESSMENT

I. OBJECTIVES

- Assess effects of the Upper Goose Fire and suppression actions to 1) Federal species with special status [species listed as endangered, threatened, proposed, candidates or species of concern under the Endangered Species Act (ESA)]; 2) State species of concern [(species listed as endangered, threatened, sensitive or candidates by the Washington Department of Fish and Wildlife (WDFW)]; and 3) species of Tribal Importance. This assessment covers birds, mammals, amphibians, reptiles, fish, insects and their habitat.
- Assess effects of proposed emergency stabilization actions to listed species and habitat.
- Initiate Emergency Section 7 Consultation with the U.S. Fish and Wildlife Service (USFWS) and NOAA's National Marine Fisheries Service (NMFS) if required by the ESA.
- Assess effects of fire and suppression action to habitat improvements.

II. ISSUES

- 7 agency-listed (State and/or Federal) wildlife species occur within or near the fire area.
- Potential effects to these species from the fire, suppression actions and potential post-fire effects.
- Potential effects to listed species from proposed emergency stabilization actions.

III. OBSERVATIONS

A. Background

The purpose of this Burn Area Emergency Stabilization (ES) Wildlife Assessment is to assess the effects of the Upper Goose Fire, suppression actions, proposed emergency stabilization work, and potential post-fire erosion, to all Federally-listed, State-listed, agency-sensitive, and culturally-important species and their habitats which may be affected by the fire. This assessment also includes documentation of Emergency Section 7 Consultation, if required by the ESA, with USFWS and NMFS. The species list for the fire area was developed by Randy Hill and Howard Browers, Wildlife Biologists, USFWS, Mid-Columbia National Wildlife Refuge Complex. Species occurrence discussed in this assessment is based on formal surveys and habitat inventories conducted prior to the Upper Goose Fire, and post-fire reconnaissance. Documents, inventory data, sighting records, vegetation maps and other species specific information referenced in this report are on file at the Complex office.

The Upper Goose Fire occurred within The Columbia National Wildlife Refuge (Refuge). The Refuge is located in the Pacific Flyway. Habitats within the fire area serve as resting, feeding, and nesting areas for many migratory bird species in addition to many resident species of wildlife and invertebrates.

B. Reconnaissance Methodology

Information used in this assessment is based on a review of relevant literature, agency management planning documents, agency wildlife sighting and habitat inventory data, communication with USFWS, personal communication with agency biologists (listed at end of report), and reconnaissance of the fire area on August 1, and September 5, 2007. Habitat information and mapping for the various species is based on agency records and post-fire reconnaissance.

C. Findings

To better understand the species and habitat information discussed in this wildlife assessment, it is important to review the Upper Goose Fire ES Vegetation and Soils Resource Assessments. These reports contain more detailed descriptions of pre-fire vegetation, post-fire vegetative recovery estimates, and effects to the watersheds. Representative photos taken of burned areas during post-fire reconnaissance are located in the appendix.

The purpose of this assessment is to discuss the potential effects of the fire, suppression actions and proposed emergency stabilization activities to Federally-listed and State-listed and sensitive species which occur within the fire area. Effects to wildlife species without special Federal or State status are not discussed. This assessment is not intended to definitively answer the many questions of effects to specific species that are inevitably raised during an incident such as the Upper Goose Fire. Rather, the focus of this assessment is to identify immediate, emergency actions that may be necessary to prevent further effects to these species. Because the species discussed in this assessment have ranges or territories which extend beyond the fire area, the assessment includes information at a larger scale, across land ownership boundaries for species which may require assessment for long term rehabilitation and restoration.

BIOLOGICAL EVALUATION

Direct effects as described in this report refer to mortality or disturbances that result in flushing, displacement, harassment or mortality of the subject animal. Indirect effects refer to modification of habitat and/or effects to prey species.

The community of plants and animals found in this area represents one of the remaining examples of the shrub-steppe ecosystems that once covered the Columbia River Basin (USFWS 2000). The Refuge contains rare, rich and diverse shrub-steppe ecosystem flora and fauna that have been lost elsewhere due to habitat conversion, fragmentation,

and application of pesticides. This area serves a critical role in contributing to the local, regional, national, and international ecological integrity of the shrub-steppe ecosystem (USFWS 2000).

While fire has played an integral role in the history of the shrub-steppe environment, the region's historical fire regime has been greatly altered by socio-political and economic factors (USFWS 2000). Coupled with the arrival of invasive species and noxious weeds, these mechanisms have slowed or precluded the natural recovery processes of the shrub steppe ecosystem from disturbance events such as fire. Managing for biological integrity in this area necessitates that actions be taken to mitigate the ecological effects of increasing fire frequency and intensity, and invasion of exotic species (USFWS 2000).

The Upper Goose Fire resulted in negative effects to plant communities through the complete consumption of above-ground vegetation on approximately 70 to 85 percent of the upland areas. Notably, the fire destroyed approximately 651 acres of big sagebrush shrub and steppe habitat. Sagebrush is a food source and/or provides nesting, resting, thermal, and escape cover for a wide variety of species. Sagebrush also provides a thick canopy which protects understory vegetation which in turn can be a valuable food source for wildlife (USFWS 2000). Wildlife species in the area of the Upper Goose Fire that are dependent on shrub-steppe and have Federal or State listing status include: Washington ground squirrel, ferruginous hawk, loggerhead shrike, black-tailed jackrabbit, and striped whipsnake.

Wildlife Species of Concern:

Upper Goose Fire Species List

On August 8, 2007, a current species list for Grant County, which encompasses the Upper Goose area, was obtained from the USFWS's Upper Columbia River Fish and Wildlife Office, Spokane at the following web address: http://www.fws.gov/easternwashington/documents/Grant%20Cty%208-8-07.pdf.

Concurrently, an up-to-date list was obtained of similar species likely to occur in the Columbia River Basin and under the jurisdiction of NMFS (http://www.nwr.noaa.gov/ESA-Salmon-Listings). Federal agencies are also charged with managing for species of importance to the Native American Tribes. From this broad inventory, a list of species more specific to the Upper Goose Fire area and adjacent lands was obtained through consultation on September 5, 2007 with Randy Hill and Howard Browers of the USFWS.

The following species list summarizes all wildlife species under the jurisdiction of the Refuge that are known to occur or have the potential to occur in the fire area during at least portions of the year. For plant species of concern see Vegetation Assessment.

SPECIES LISTING STATUS

Bald eagle (*Haliaaetus leucocephalus*) FM/ST Washington ground squirrel (*Spermophilus washingtoni*) C/SC

| Ferruginous hawk (Buteo regalis) | FSC/ST |
|--|--------|
| Loggerhead shrike (Lanius ludovicianus) | FSC/SC |
| Striped whipsnake (Masticophus taeniatus) | SC |
| Black-tailed jackrabbit (Lepus californicus) | SC |
| Mule deer (Odocoileus hemionus) | TI |

The following listed species were identified as occurring, or having habitat within Grant County. Through post-fire reconnaissance and consultation with local experts, it was determined that these species were not affected by the fire because they have no habitat within or adjacent to the fire area, and/or inventories prior to the fire determined absence, and/or the fire is outside of the species range or season of use.

| Upper Columbia River spring Chinook salmon, | E/SC |
|---|--------|
| Onchorynchus tshawytscha Middle Columbia River steelhead, Onchorynchus mykiss | T/SC |
| Upper Columbia River steelhead, <i>Onchorynchus mykiss</i> | E/SC |
| Pygmy rabbit (<i>Brachylagus idahoensis</i>) | L/3C |
| Columbia Basin distinct population segment | E/SE |
| Bull trout (Salvelinus confluentes) | L/SL |
| Columbia River distinct population segment | T/SC |
| Greater sage-grouse (Centrocercus urophasianus) | C/ST |
| Burrowing owl (Athene cunicularia) | FSC/SC |
| California floater (<i>Anodonata californiensis</i>) | FSC/SC |
| Columbian sharp-tailed grouse | 100/00 |
| (Tympanuchus phasianellus columbianus) | FSC/ST |
| Giant Columbia spire snail (<i>Fluminicola columbiana</i>) | FSC/SC |
| Greate sage grouse (Centrocercus urophasianus) | FC/ST |
| Long-eared myotis, (<i>Myotis evotis</i>) | FSC |
| Kincaid meadow vole (<i>Microtus pennsylvanicus kincaidi</i>) | FSC |
| Northern goshawk (<i>Accipiter gentiles</i>) | FSC/SC |
| Northern leopard frog (<i>Rana pipiens</i>) | FSC/SE |
| Pacific lamprey (Lampreta tridentata) | FSC |
| Pallid Townsend's big-eared bat | . 00 |
| (Corynorhinus townsendii pallescens) | FSC/SC |
| Redband trout (Oncorhynchus mykiss) | FSC |
| River lamprey (<i>Lampreta ayresi</i>) | FSC |
| Sagebrush lizard (<i>Scleropus graciousus</i>) | FSC/SC |
| Western brook lamprey (<i>Lampreta richardsoni</i>) | FSC |
| (-2 | |

KEY TO LISTING STATUS:

FLE FEDERAL LISTED ENDANGERED
FLT FEDERAL LISTED THREATENED
FC FEDERAL CANDIDATE
FSC FEDERAL SPECIES OF CONCERN

FM FEDERAL MONITOR
SC STATE CANDIDATE
SE STATE ENDANGERED
ST STATE THREATENED
SS STATE SENSITIVE
TI TRIBAL IMPORTANCE

Bald Eagle

As of August 8, 2007, the bald eagle was officially removed for the endangered species list and is now a Federal monitor species. Bald eagles will continue to be monitored and protected under the Bald and Golden Eagle Protection Act. The State considers bald eagle a threatened species. Bald eagles do not nest anywhere on The Refuge or the local vicinity. Bald eagles do inhabit The Refuge from fall through spring, becoming very common during the winter months. Lower Crab Creek and its riparian zone provide overwintering habitat for waterfowl, which also winter on The Refuge. Large concentrations of waterfowl wintering on The Refuge provide a predictable forage base for wintering eagles.

Fire Impacts

The Upper Goose Fire had no effect on bald eagles either directly or indirectly. Cover and foraging habitat along Lower Crab Creek were not eliminated by the fire, so suitable waterfowl wintering areas still exist. Therefore, potential forage for bald eagle was not eliminated by the fire.

Washington Ground Squirrel

The Washington ground squirrel is a Federal and State candidate for listing. This area is potential habitat for Washington ground squirrels, however, it is not known if this habitat was occupied during the fire. The Washington ground squirrel is a brownish-gray squirrel with conspicuous white spots on the dorsum. This species occurs only in Washington east of the Columbia River (USFWS 2007). It prefers deep sandy soils in dry, open, sagebrush and grassland habitats. This species hibernates 7 to 8 months per year from June/July through January/February. These squirrels eat succulent vegetation and bulbs in early spring and seeds in the early summer. Burrows are usually about ≤ 3 inches in diameter and entrances are often hidden under bushes or rocks (Yensen and Sherman 2003). There are no known burrows within the fire area; however this area has not been thoroughly surveyed to date. The removal of shrub cover due to the fire represents a significant decrease of suitable habitat for this species. This habitat loss may delay or prohibit recovery of the Washington ground squirrel in Washington (USFWS 2007).

Fire Impacts

Any Washington ground squirrels within the fire area would have been hibernating during the fire. However, depending upon heat and fire intensity, animals may have

suffered mortality within their burrows. The removal of shrub cover will impact the habitat for Washington ground squirrels which require shrubs for hiding cover as protection from predation. Further, the potential conversion of native bunch grass areas to annual grasses (cheatgrass, *Bromus tectorum*) will impact the habitat for Washington ground squirrels (USFWS 2007). Habitat degradation of rangelands and shrub-steppe areas is recognized as a major cause of decline in this species (Yensen and Sherman 2003). Stabilization of the area to prevent cheatgrass invasion and assist the return of native grasses and shrubs is important to maintain the area as potential Washington ground squirrel habitat.

Ferruginous Hawk

Ferruginous hawks are a Federal species of concern, a Federal Migratory bird of Conservation Concern (USFWS 2002) and a State-threatened species. The only known ferruginous hawk nest on The Refuge occurs in the area of the Upper Goose Fire. In addition, all of the 705 acres is potential foraging habitat for ferruginous hawks because it serves as potential habitat for its prey. (See Maps, Appendix III)

Ferruginous hawks are migratory raptors that occur on The Refuge during the breeding season from early March through August (USFWS 2000). The incubation period is 28 to 33 days with fledging at 44 to 48 days from the date the egg is laid. The burn area is well within the foraging area for active nesting territories. It should be noted, however, that nesting raptors are not monitored every year, and historic nest locations may be reused in later years. Ferruginous hawks demonstrate nest site fidelity, returning to the same nesting territories in subsequent years. The fact that some territories within the burn area were not used during this season does not mean they would not be viable in future years. Many territories in Eastern Washington are unoccupied due to the current decline in the State-wide population of ferruginous hawks. Available nesting territories are not currently thought to be limiting the population and, if the population rebounds, currently unoccupied areas may become occupied (Watson 2003). Ferruginous hawks are sensitive to human presence, and will abandon their nests if subject to human encroachment. Activities (especially those that are noisy) near nesting sites should be limited during the breeding and fledging season (USFWS 2000).

Ferruginous hawks prey on a variety of mammals, birds, reptiles, and insects, depending upon local area and prey abundance. These hawks may forage up to 15 km (approximately 9 miles) from their nest site; however, nest success may be greater in areas where abundant forage is in close proximity to the nest location. Areas where prey densities are high generally have more successful nesting attempts. The average home range size of ferruginous hawk in Washington may be as large as 7,660 acres (31 sq. km = 11 sq. miles), based on hawks traveling considerable distances to forage (WDFW 1996).

Fire Impacts

The entire 705 acres of the Upper Goose Fire (See Maps, Appendix III) can be considered ferruginous hawk habitat. Because the fire occurred in mid-July, ferruginous

hawks were likely present during the fire, but adults and fledglings are mobile enough to escape the burn area and suppression activity. Nest sites are located on steep cliffs and far removed from significant sources of fuel. Post-fire reconnaissance indicated no damage to nests from the fire. Fire suppression activities were far removed from nest sites so they likely did not affect ferruginous hawks.

Other impacts to ferruginous hawks from the fire and suppression activity are indirect and include a reduction of habitat diversity that supports prey for ferruginous hawks and decrease of habitat for foraging. The WDFW considers the ferruginous hawk a Priority Species for management and recognizes that the species benefits from land-use practices that ensure an adequate prey base. WDFW recommends that landowners/managers should protect shrub-steppe and grassland habitats that harbor significant populations of small mammals and other prey (Richardson et. al. 2004). Further, to promote habitat stability and to benefit ferruginous hawk prey populations, WDFW recommends reseeding of native plant species after chaining or burning (Richardson et al. 2004, Olendorff 1993). Therefore, stabilization of foraging habitat lost in the Upper Goose Fire is essential. Stabile foraging habitat around nest sites that supports an abundance of prey species for the ferruginous hawk is likely critical for the recovery of this species in Washington.

Loggerhead Shrike

Loggerhead shrikes are a Federal species of concern, listed as a Migratory bird of Conservation Concern (USFWS 2002), and are a State candidate for listing as a threatened species. The Loggerhead shrike is a neo-tropical migrant species that breeds on The Refuge. During the breeding season, there were documented sightings of shrike in the fire area. Further, based on habitat prior to the fire and the fact that this area has not been systematically surveyed for shrikes, it is likely that there were additional breeding territories in the fire area.

Loggerhead shrikes are common on the Refuge from early March until the end of August (USFWS 2000). After August, numbers are reduced, but individuals have been sighted through early November. Loggerhead shrikes require mature sagebrush, or other shrubs, for breeding and foraging habitat. Loggerhead shrikes are most abundant in habitats of relatively-high horizontal and vertical structural diversity (Poole 1992). This species builds its nest within shrubs, and requires some sort of shrub or other habitat feature when foraging for and impaling its prey. The species is well-known for its unusual and complex behavior of impaling prey on sharp objects in conspicuous places or wedging prey in narrow V-shaped forks (Yosef 1996). The primary prey items of this species are insects (e.g., beetles and grasshoppers), although small mammals, small birds, and lizards are also taken as prey (Yosef 1996). Loggerhead shrikes are highly territorial, and they exhibit a high level of nest site/territory fidelity. Studies to the south on the Hanford Reach National Monument (Poole 1992) found that shrikes defended territories averaging 34.4 acres (+4.9 ac). Also on the Hanford Site, of 113 territories studied, 96 percent were reoccupied the following season (Poole 1992). Loggerhead shrikes remain in breeding territories as fledglings for 3 to 4 weeks after leaving the nest. This post-fledging period is the time of highest mortality for shrikes, when young

birds are weak fliers and are vulnerable to predation (Poole 1992). The Upper Goose Fire burned during this critical time period.

The loggerhead shrike is one of the few North American passerines whose populations have declined continent wide in recent decades (Yosef 1996), and Washington Breeding Bird Survey data for the Columbia River Basin show a significant decline in the shrike population over the last 26 years (Vander Haegen 2004). Burning and wildfires may create the greatest risk to local shrike populations because the damage is immediate and regeneration to pre-burn condition may take up to 30 years (Harniss and Murray 1973).

Fire Impacts

Impacts from the Upper Goose Fire to shrikes are both direct and indirect and include loss of cover, loss of prey base, loss of habitat for nesting and foraging, and loss of structural diversity of habitat required for shrike use of the area. Areas of big sagebrush that were burned in the Upper Goose Fire were used by loggerhead shrike. Adults that were present during the fire, however, are mobile enough to escape harm from the fire and suppression measures. Unburned big sagebrush exists adjacent to burned areas, so flushed adults could have found cover from predators in these areas. If weak-flying fledglings were present, they may have been consumed by the fire. Because shrikes exhibit fidelity to nesting territories, individuals that attempt to return to former territories in subsequent breeding seasons will find them void of nesting cover and structure. Additionally, displacement of individual breeding pairs into adjacent big sagebrush may increase inter- and intraspecific competition for nesting territories. If suitable habitat areas are already occupied by breeding pairs, displaced pairs may not be able to locate territories, or will be forced to utilize marginal habitat types. Breeding success would likely decline for pairs that have been displaced by fire impacts to their breeding habitat.

Habitat loss is combined with cumulative losses due to repeated fires on The Refuge. Nine individual loggerhead shrikes were observed during post-fire reconnaissance.

The WDFW considers the shrike a Priority Species for management and provides the following management recommendations for loggerhead shrike habitat: retain shrub-steppe communities, especially big sagebrush and mixed shrub communities, avoid wildfires and activities that may increase invasion by exotic vegetation, and avoid management activities that increase cheatgrass invasion or increase risk of wildfire (Vander Haegen 2004, Leu and Manuwal 1996). Stabilization of the habitat within the fire area is critical for Refuge management of this declining species.

Striped Whipsnake

The striped whipsnake is a State candidate species. The striped whipsnake is a long slender snake that is dark above, with alternating light and dark stripes down the length of the body. Adults range in size from 90 to 180 cm total length. This species is rare throughout most of its range in Washington. Striped whipsnakes have been documented in Washington only 26 times. In the last decade, only 3 observations have

been reported (USFWS 2007). This species occurs in low-elevation (less than 1,985 feet) arid regions with scattered vegetation and open rocky areas (USFWS 2007). They require shrubs for cover and rock crevices or rodent burrows for egg laying and hibernation (Nordstron and Whalen 1997). Rodent burrows in sagebrush or near tallus slopes, canyons or ravines are considered optimal striped whipsnake habitat (Nordstrom and Whalen 1997). Prey species are primarily lizards, but may include rodents, bats, frogs, birds, and other snakes. Mating occurs in the spring, and eggs are laid in June, and hatched in the late summer or early fall. Areas of Grant County where they are known to occur have relatively undisturbed shrub-steppe habitat with a low cover of cheatgrass.

(Washington Department of Natural Resources at web page: http://www.dnr.wa.gov/nhp/refdesk/herp/speciesmain.html)

Fire Impacts

If present during the fire, striped whipsnakes could have experienced mortality if unable to move quickly or find a burrow. Those that survived would experience temporary displacement. Eggs exposed to heat would have been rendered unviable. Suppression actions may have exposed nest sites to hazardous conditions and predators and/or destroyed nest sites. Given the rarity of the species, indirect impacts related to habitat loss and decreased prey abundance are more likely. The entire 651 acres of shrubsteppe habitat that burned during the Upper Goose Fire are potential striped whipsnake habitat. Rodent burrows, canyons, and tallus slopes, which serve important functions in the life history of whipsnakes, are present within the burn area. Habitat within the fire area for prey was greatly reduced. Therefore, prey species may be less available for the striped whipsnake until the habitat recovers and is repopulated by the various prey species. Invasion of cheatgrass into the fire area will reduce the likelihood that this area would recover into habitat that could support striped whipsnakes.

Black-tailed Jackrabbit

Black-tailed jackrabbit is a State candidate species. Given its size and mobility, all of the 705 acres of the Upper Goose Fire (See Maps, Appendix III) are potential black-tailed jackrabbit habitat. However, black-tailed jackrabbit sightings within the burn area are very rare (5 since 1990). Minimal mature shrub cover likely reduces its use of the burn area.

The black-tailed jackrabbit was once abundant throughout the Columbia Basin (USFWS 2000). Recent precipitous declines in populations of these hares have raised concerns regarding their distribution and status throughout the region. This species is closely associated with the sagebrush-steppe ecosystem. Black-tailed jackrabbits rely on sagebrush vegetative structure for breeding sites and hiding cover, and require sagebrush vegetation as forage during winter months. Black-tailed jackrabbits breed from late February to mid-July, with gestation lasting 41 to 47 days (Flinders and Chapman 2003). They can have two to six litters per year, with local populations likely trending towards the low end of this scale (Flinders and Chapman 2003). Hares, unlike rabbits, do not use burrows. They place their young in shallow depressions in the soil

called *forms*. Jackrabbits are generally solitary and primarily nocturnal. They are vulnerable to predators including, coyotes, bobcats, foxes, hawks, owls, and snakes. Loss of habitat due to agricultural and human development has impacted jackrabbit populations. The fragmentation and isolation of populations residing within remnant habitat areas has probably increased their vulnerability to stochastic events (e.g. severe weather, disease, and fire) and has limited the re-colonization of areas that could potentially support jackrabbit populations (USFWS 2000).

Fire Impacts

No direct impacts to the black-tailed jackrabbit appear to have resulted from the fire. Black-tailed jackrabbits are known to be relatively fast-moving animals. Because these animals are highly mobile, it is anticipated that adults would have been swift enough to avoid the fire and suppression activity. If present, recently birthed young, however, were likely consumed in the fire as they would not have been able to flee. Some indirect impact occurred due to loss of native foraging habitat and cover. Due to this indirect impact from the fire, jackrabbits will be more vulnerable to predation if forced to seek forage or cover in other areas. When combined with cumulative losses due to repeated fires on the Refuge, the habitat lost due to the Upper Goose Fire represents a notable impact to black-tailed jackrabbit habitats, and may negatively affect their continued persistence within the Refuge. Habitat stabilization to prevent cheatgrass infestation and encourage native shrub and grass re-colonization within the burn area is critical to maintaining viable black-tailed jackrabbit habitat on The Refuge.

Mule Deer

Mule deer is a species of Tribal importance. Mule deer are a common resident ungulate on the Refuge. Mule deer are primarily browsers and rely on riparian vegetation and bitterbrush for food (USFWS 2000). Mule deer also seek cover in riparian areas along lower Crab Creek.

Fire Impacts

Mule deer were not likely directly impacted by the Upper Goose Fire or fire suppression. Mule deer are highly mobile animals, and it is anticipated that they were able to move out of the affected area during the fire. Although no mortality of deer fawns was documented during post-fire reconnaissance, recently-born fawns may not have been able to avoid the fire; indirect impacts include loss of habitat. The entire burn area (705 acres) is potential mule deer habitat. The greatest impact to Mule Deer from fire is loss of available forage (USFWS 2000). Re-growth of grasses in upland areas is not anticipated until fall rains begin, possibly in November. Regrowth of shrub species is expected to be minimal due to high fire residence times and the cumulative impacts to species richness/seed banks by past fires. Overbrowsing in other areas is likely to occur. Additionally, deer may also experience some nutritional stress due to the fire. Lactating females may be at the greatest risk of this type of stress because of the energy demands that lactation produces (USFWS 2000).

IV. RECOMMENDATIONS

A. Fire Suppression:

Determinations of effect: The fire and suppression actions had no directly attributable effect to Federally-listed species. Furthermore, proposed emergency stabilization will have no effect on Federally-listed species. Therefore, there is no need for emergency ESA Section 7 Consultation for the Upper Goose Fire stabilization. Indirect impacts, however, due to loss of habitat occurred to several Federal species of concern and State-sensitive species. Stabilization treatments will mitigate habitat damages by minimizing invasion of non-native vegetation onto burned areas and encouraging recolonization by native grasses and shrubs. These treatments will actually benefit listed species. Supporting documentation is included in the environmental compliance section of this report.

B. Emergency Stabilization:

Allowable Actions: Stabilize soil to prevent loss or degradation of productivity by seeding to prevent establishment of invasive plants; and by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area.

Recommendations with Specifications:

- #1 Non-native invasive species control Integrated Pest Management. Use integrated pest management (IPM) techniques (herbicides, biological, mechanical, and cultural control methods) as appropriate to prevent the spread and establishment of non-native weeds within the fire area. This specification is critical, as mentioned above in wildlife species assessments, to stabilize the ecological integrity and condition of the burned area and to create a trajectory of vegetation recovery that will eventually result in viable habitat conditions for all of the listed species addressed above. IPM methods will be timed to occur when listed species are absent or least likely to occur on or adjacent to lands receiving the treatment.
- #2 Non-native invasive species control native seedings. This specification is critical, as mentioned above in wildlife species assessments, to stabilize the ecological integrity and condition of the burned area and to create a trajectory of vegetation recovery that will eventually result in viable habitat conditions for the shrub-steppe- dependent species addressed previously. Seeding will be timed to occur when listed species are absent or least likely to occur on or adjacent to lands receiving the treatment.

C. Management recommendations (Non-Specification Related):

Permanent photo points and monitoring transects should be established in

key wildlife habitat locations to monitor habitat recovery. This should be coordinated with the vegetation monitoring as recommended in the Upper Goose Fire Vegetation Damage Assessment.

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VI. Agency Biologists

Randy Hill, Wildlife Biologist, USFWS, Mid-Columbia River Refuges Complex, (509)488-2668

Howard Browers, Wildlife Biologist, USFWS, Mid-Columbia River Refuges Complex, (509) 371-9212 ext. 302

BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE OPERATIONS ASSESSMENT

I. OBJECTIVES

- Identify, inventory, and map fire suppression impacts on jurisdictions affected by the fire.
- Specify rehabilitation measures to mitigate fire suppression impacts.
- Coordinate with local agencies so that specification recommendations are consistent with agency objectives.
- Protect natural and cultural resource values during rehabilitation efforts.

II. ISSUES

- Potential impacts to critical natural and cultural resources from suppression actions.
- Soil disturbance on highly erodable soils from fire suppression activities.

III. OBSERVATIONS

A. Background

Please refer to fire history summary.

B. Reconnaissance Methodology and Results

On July 18, 2007, refuge staff began evaluating resource impacts caused by the suppression effort on lands and physical improvements with the Upper Goose Fire area. Information was obtained from suppression forces, the Columbia NWR manager, and the complex supervisory biologist.

C. Findings

The Upper Goose Fire burned approximately 705- acres on Columbia National Wildlife Refuge (Refuge), per Maps, Appendix III.

Rehabilitation of suppression line is necessary to protect habitats from noxious weed infestation, ORV intrusion on the landscape, and to minimize fragmentation of ecological areas. Monitoring of suppression lines is necessary to determine the need for future noxious weed mitigation needs. A complete cultural resource assessment will be completed on all suppression lines within the fire (refer to Cultural Resources Assessment).

IV. RECOMMENDATIONS

A. Management (non-specification related)

- Continue to review rehabilitation specifications with operators and other personnel associated with implementation of the BAER Plan to insure suppression rehabilitation specifications are clearly understood for protection of sensitive resources and land productivity. Ensure proper accounting procedures are followed in the repair of suppression related impacts through suppression accounts.
- Guarantee safety of personnel assigned to rehab operational assignments in the fire area.
- Monitor suppression related damage on dirt roads following fall and winter moisture events to see if additional rehab measures are necessary.

V. CONSULTATIONS

Regional Office Archaeologist, FWS Rich Poetter, Refuge Manager Randy Hill, Wildlife Biologist Howard Browers, Wildlife Biologist, FWS Heidi Newsome, Wildlife Biologist, FWS Kevin Goldie, Wildlife Biologist, FWS

BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE WATERSHED AND SOIL DAMAGE ASSESSMENT

I. OBJECTIVES

- Assess overall watershed changes from the fire and fire suppression efforts, particularly those that pose substantial threats to human life, property, and critical natural and cultural resources. This includes evaluating changes to soil conditions, hydrologic function, watershed response to precipitation events, and stream flow conditions.
- Assess soils and loss of vegetation to wind erosion.
- Prescribe treatments to mitigate watershed and soil damage impacts and risks.
- Discuss burn severity.
- Identify future monitoring needs.
- Provide management recommendations to assist in watershed stabilization, road erosion issues, and wind erosion.

II. ISSUES

- Existing roads were damaged by fire response vehicles.
- New roads (wheel tracks) were created by fire response vehicles
- Burned vegetation in areas of soils susceptible to wind erosion.

III. OBSERVATIONS

A. Background Information

This report identifies and assesses observed and predicted impacts to soil and watershed function in the Upper Goose Fire area on Columbia National Wildlife Refuge (NWR). Measures to reduce significant degradation impacts caused by changes to the watershed due to fire and fire suppression efforts (damage to roads by fire suppression vehicles) are discussed. Recommendations for future monitoring management considerations are also briefly listed.

Overview of the Upper Goose Fire: The Upper Goose Fire, fire number 13580-9141-DQJ1 was reported at approximately 13:30 on July 13, 2007. The Upper Goose Fire demonstrated extreme fire intensity on about 65-percednt (%) of the burned area as it was pushed through the shrub-steppe community by gusting and fire generated convective winds. Afternoon wind-driven flames moved quickly before being slowed by canyon walls. Much of the fire moved slowly through a large part of the burned area as humidity rose and winds diminished toward the evening and overnight. The remaining 35% of the burned area

was consumed by a moderately intense backing fire. Total acres burned for this fire were 2,258 with 705 of those acres being on United States Fish and Wildlife Service (USFWS) managed land. (See Maps, Appendix III)

The area was burned previously by the 1992 Goose Lake Fire. The effects of that fire were similar to the damage observed from the current Upper Goose Fire. Evidence of extensive erosion problems related to the 1992 fire were not observed or documented. The emergency stabilization measures recommended for the 1992 fire were apparently successful in stabilizing fire related degradation of soil and watershed quality.

B. Reconnaissance Methodology

Due to the focused nature of the reconnaissance methodology utilized by the First Strike-Shaw team, a through discussion of the entire burned area is not included in this assessment. However, personnel with the USFW provided the Shaw Team a 1/2-day field reconnaissance trip of the Upper Goose Fire area. The focus of the trip was along the dirt access road in township 17 north, range 28 east, section 36. This assessment is based on the observations made during that trip, discussions with USFW staff, and documents reviewed. During the field reconnaissance, Shaw made observations on:

- Burn severity
- Soil Conditions
- Hydrophobic Soils
- Watershed Conditions

C. Findings

Overview of Fire Effects.

- Approximately 70% to 85% of the area within the fire limits was burned.
- Approximately 30% of the burned area is susceptible to wind erosion.
- Burn intensities for the area burned can be divided into: 40% low intensity, 45% moderate intensity, and 15% severe intensity.
- Approximately 90% to 95% of the vegetation was burned. Regeneration success for bunch grass is anticipated to be 60% and cheat grass is anticipated to be greater than 70%.

Road Damage. Road damage can be divided into two general categories: 1) existing roads and 2) new roads created during fire suppression activities. The road damage by category is discussed below (photo documentation of many of the damaged areas is provided in Appendix IV):

Existing roads. The preexisting access road was primarily a compacted soil track
with a vegetative ground cover, adequate for occasional light truck traffic. The
road did not have a constructed subbase. Damage to the road by fire suppression
vehicles and heavy fire engine traffic was extensive due to the constant vehicle

traffic and heavy weights. The road is now nearly impassable to a normal 4 wheel drive vehicle. The formerly compacted road has deteriorated to a loose silt that is approximately 1-foot thick, or more in some locations. Some road segments have ruts up to 1.5-feet deep. Additional vehicular traffic will further degrade the road. Rainfall could cause water erosion along steeper sections, which are also subject to wind erosion.

 New roads. Fire suppression efforts along the edges of the fire and along boundary fences created wheel-track trails. The weight of the vehicles have compacted the soils, and negatively impacted native vegetation and microbiotic crusts. The soils are very fragile and were damaged after just a few fire vehicles passed over the same track. In addition, these new tracks provide an increased potential for off-road vehicles to trespass onto the site. Generally these roads are not deeply rutted or filled with deep silt.

Fence Damage. Both the fence along the west boundary and the fence that separates Para land at the Adams County line (including wooden sign posts and refuge boundary signs) were either damaged or destroyed. The lack of adequate fencing could allow cattle grazing on adjacent lands to easily move onto the NWR land and graze on the remaining vegetation or new vegetation. Cattle movement will adversely impact soil conditions, increasing the amount of soil loss due to rain and wind erosion.

Soils Damage. Soils are primarily Starbuck-Bakeoven-Rock Outcrop and Prosser-Starbuck very fine sandy loam on the eastern portions of the NWR, with a minor amount of Schwana Complex (loamy fine sand) on the western side of the NWR. Smaller inclusions of Ephrata fine sandy loam, which has a high hazard of soil blowing, occupy some canyon bottoms including the main access road into the burned area (Gentry, 1984). The site generally has topography of outcrops form bluffs (25 to 100 feet tall) creating mesas separated by sandy draws.

The climate is dry and semiarid. Average annual precipitation is approximately 8-inches (Gentry, 1984). Winds generally are from the west, commonly with gusts of 20 to 30 miles per hour.

Soil condition observations during the field reconnaissance are listed below:

- Soils tested with a water bottle at several locations did not demonstrate hydrophobic conditions. Likely due to low to moderate burn severity, a thin layer (approximately 1-inch) of ash from the Mount Saint Helens 1981 eruption, and generally well drained soils.
- The microbiotic crusts were well developed and only moderately impacted in most areas.
- Rill and gulley erosion was not observed.
- The topography is generally of low relief, individual drainage basins are not large enough to capture large amounts of rainfall for concentration into stormwater runoff channels.

The amount of soil erosion due to rainfall events is likely to be low due to the relatively intact microbiotic soil crust, small pebbles exposed at the surface, and intact vegetation. However, 25-year events (or greater intensity, e.g. 50-year), would have the capability to dislodge and transport soil particles. Large or catastrophic mass soil wasting is not anticipated due to the general low relief of the site, small catchment areas for rainfall, and the rocky nature of the soil.

Wind erosion has the capability to remove and transport fine particles in areas where the vegetation has been burned. Soil erosion by wind, will typically be minimal during the first year till vegetation efforts are successful, if typical wind conditions prevail.

IV. RECOMMENDATIONS

A. Emergency Stabilization: (specification related)

To reduce the impacts of wind erosion areas that can be seeded should be. Seed drilling, aerial broadcast, and tractor based broadcast seeding methods are viable options. These stabilization measures are further detailed in the vegetation assessment. Therefore the recommendation is to implement the measures specified in the Vegetation Damage Assessment.

B. Rehabilitation (non-specification related treatments)

Submit long-term rehabilitation plan as required to stabilize soils, maintain road stability, control non-native invasive species and protect ecological integrity of the site.

C. Monitoring (non-specification related)

- U.S. Fish and Wildlife Services staff should monitor soil erosion conditions along steep sloped areas, such as along the bases of bluffs or where drainages empty into the floodplain along Crab Creek.
- Monitor road conditions on reclaimed roads and rehabilitated roads.

D. Management Recommendations (non-specification related)

- Prevent access to roads and fire trails during recovery. Monitor suppression related damage on dirt roads following fall and winter moisture events to see if additional rehabilitation measures are necessary.
- Continue to review rehabilitation specifications with operators and other personnel associated with implementation of the BAER Plan to insure suppression rehabilitation specifications are clearly understood for protection of sensitive resources and land productivity. Ensure proper accounting procedures are followed in the repair of suppression related impacts through suppression accounts.
- Provide for the safety of personnel assigned to rehabilitation operational

assignments in the fire area.

• Increase law enforcement patrols through the fire area until vegetation is reestablished.

V. Consultations:

Randy Hill, USFW Rick Poetter, Refuge Manager USFW

VI. References:

Gentry, Herman R. 1984. Soil Survey of Grant County, Washington. Prepared by the United States Department of Agriculture, Soil Conservation Service, in cooperation with the Washington State University, Agriculture Research Center. January.

BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE WETLAND AND RIPARIAN RESOURCE ASSESSMENT

I. OBJECTIVES

- Evaluate and assess Upper Goose Fire and suppression impacts to wetland and riparian resources and identify values at risk associated with vegetation losses.
- Determine emergency stabilization and monitoring needs supported by specifications to aid in vegetation recovery and soil stabilization.
- Provide management recommendations to assist in wetland and riparian recovery, site productivity and species habitat protection.

II. ISSUES

- Protection and enhancement of other resource values, including site productivity, wildlife habitat, vegetation resources, cultural resources, and watershed stability.
- Management strategies which provide for the stabilization, natural regeneration and recovery of impacted areas.
- Immediate stabilization of denuded soils that may impact ecological function
- Monitoring of the planting/seeding effectiveness of emergency stabilization efforts.
- Monitoring of impacted lands for the early detection and control of invasive and noxious weed species.

III. OBSERVATIONS

This report identifies and addresses known and potential impacts to wetland and riparian resources within the Upper Goose Fire (Fire) area on Columbia National Wildlife Refuge (Refuge). The Fire started on July 13, 2007 and burned 2258 acres of contiguous area, 705 acres of which were located on the Refuge.

The wetland and riparian resources near the Fire are located towards the SE corner of the burn, directly adjacent to Lower Crab Creek. The wetland type is predominantly Palustrine emergent persistent (PEM1). Palustrine emergent wetlands can be divided into two types: persistent and non-persistent. Palustrine emergent wetlands (persistent) are dominated by species that normally remain standing at least until the beginning of the next growing season. Common plants found in this habitat include cattails (Typha latifolia), bulrushes (Scirpus acutus), sawgrass (Cladium_spp.) and other sedges (Carex spp.), and true grasses, such as reed (Calamagrostis_spp.) and manna grasses (Glyceria_spp.). A variety of

broad-leafed persistent emergents such as purple loosestrife (Lythrum salicaria), and dock (Rumex spp.) are also present.

Riparian zones are areas where vegetation derives its hydrologic support from a water body, or its seasonal overflow. The plant communities along the Creek margins comprise the riparian vegetation zone and are characterized by hydrophilic plants. Hydrophilic plants are specially suited to survive in soils that are always wet or moist. The riparian areas near the Fire area on the Refuge are narrow, ~1 to 8 m, but are very dense with vegetation.

Findings and recommendations contained within this assessment are based upon field reconnaissance of the Fire area, interviews with local resource specialists, and local land managers, and review of relevant documents.

This report details the known damage to the wetland and riparian area, will discuss future monitoring criteria, and will outline management considerations for recovery of wetland and riparian resources.

A. Reconnaissance Methodology

Ground reconnaissance was conducted and photographs were taken on July 18, by USFWS personnel, and September 5, 2007 by the First Strike/Shaw Environmental Burned Area Emergency Response (BAER) Team. The photo documentation section of this plan is contained in Appendix III. Field reconnaissance was limited to the extreme southeastern portion of the Fire area. This was the only potentially-impacted area that contained wetlands and riparian features. Since wetlands and riparian areas consistently provide valuable wildlife forage and habitat, watershed protection, water quality functions and flood prevention, assessments of these two resources were conducted.

B. Findings

1. Wetlands and riparian areas

Before the Columbia Basin Irrigation Project, Lower Crab Creek only flowed intermittently. Now it flows year round, creating important aquatic and riparian habitats on the Refuge. The creek meanders its way through the Refuge as it flows towards the Columbia River.

(http://www.fws.gov/columbiarefuge/WildlifeandHabitat/habitats.html)

Wetland habitats on the Fire are associated with Lower Crab Creek and with some seepage areas. These areas with standing or slow moving water are dominated by cattails and bulrushes (Figure 1). The cattails and bulrushes are commonly one to three meters tall and grow in dense stands with little open water between. Few other species grow in these dense stands of emergent wetland vegetation. The edge of the wetlands, as one moves towards the upland

riparian areas, is much more diverse. Numerous species thrive in this transition zone from wetlands to sedge or saltgrass (Distichlis spicata) meadow. Several plants are characteristic of the zone, including marsh sow thistle (Sonchus uliginosus) and the annual paintbrush (Castilleja exilis). Shrubs are not characteristic of the wetlands, although greasewood (Sarcobatus vermiculatus) and wild rose (Rosa woodsii) are found at the edge of the wetlands. Ground cover is high, commonly 80 to 100 percent.

The riparian areas (Figure 5) have a steeper moisture gradient than the aforementioned wetlands, and the shrubs and herbaceous layer vary considerably. Dominant shrubs are wild rose and golden currant (Ribes aureum)(NUS Corporation, 1981)

None of the wetland or riparian areas was impacted by the Fire (Figure 3). Due to the lower-intensity burn near the associated areas and the inherent fire retarding abilities of wetland vegetation, neither of these resources was harmed. However, as Figure 3 shows in detail, the areas surrounding the wetland and riparian resources were impacted. Stabilization of the surrounding lands will be important to reduce soil erosion and non-native species recruitment.

2. Associated Wetland and Riparian Vegetation:

The Fire burned approximately 2,258 total acres, 705 acres of which were on Refuge lands. The area directly to the west of the wetland/riparian complex was impacted (Figure 4). None of the wetland or riparian areas was directly impacted by the fire. (See Maps, Appendix III)

The following vegetation was present in and around the wetland and riparian areas:

| Species | |
|-------------------------|----------------------|
| Species | |
| Scientific Name | Common Name |
| Typha latifolia | Common cattail |
| Scirpus americanus | American bulrush |
| Scirpus acutus | Hardstem bulrush |
| Sonchus arvensis | Sow thistle |
| Sarcobatus vermiculatus | Greasewood |
| Eleocharis palustris | Common spike rush |
| Cirsium arvense | Canada thistle |
| Euthamia occidentalis | Western Goldenrod |
| Lythrum salicaria | Purple Loosestrife |
| Rosa woodsii | Woods' rose |
| Distichlis stricta | Saltgrass |
| Scirpus olneyi | Chairmaker's bulrush |
| Elymus glaucus | Blue wild Rye |
| Carex lanuginosa | Woolly sedge |

| Carex praegracilis | Clustered field sedge |
|------------------------|----------------------------|
| Solidago canadensis | Canada Goldenrod |
| Agropyron spicatum | Blue bunch wheatgrass |
| Anaphalis margaritacea | Western pearly everlasting |
| Bromus tectorum | Cheatgrass |
| Castilleja exilis | Indian paintbrush |
| Epilobium minutum | Minute willow-herb |
| Solanum dulcamara | Bittersweet |
| Melilotus alba | White sweet clover |
| Cirsium vulgare | Bull thistle |
| Lactuca saligna | Willowleaf lettuce |
| Scirpus maritimus | Alkali bulrush |
| Equisetum hyemale | Scouring rush |
| Elaeagnus angustifolia | Russian olive |
| Dipsacus sylvestris | Common teasel |
| Asparagus officinalis | Wild asparagus |
| Rumex spp. | Dock |
| Ribes aureum | Golden currant |

3. Vegetation/Structural Impacts

Wetland and riparian resources were not directly impacted by the Fire or by suppression tactics used to control the fire. Potential impacts to these resources could indirectly result from:

- a) Erosion from nearby burned areas depositing silt into wetlands
- b) Recruitment of opportunistic, non-native invasive species that thrive in recently-disturbed areas.

IV. RECOMMENDATIONS

A. Fire Suppression:

Suppression account - Replant and reseed all disturbed areas resulting from suppression actions with native species to protect the ecological integrity of the area. Seeding and planting will be postponed until fall of 2007 or until such time as adequate moisture provides a firm seedbed for stabilization actions. This action will ensure that excessive siltation will not impact the wetland and riparian areas adjacent to Lower Crab Creek.

B. Emergency Stabilization: (specification related)

None.

C. Management Recommendations (non-specification related)

• Ensure that non-native invasive species do not infiltrate the edge of the

- riparian buffer to the wetlands.
- Although wetland and riparian resources were not directly impacted, the following recommendations are offered to assist in the timely recovery of the Fire:

Non-native Invasive Species Control – Native Plantings Install native plants in burned area to stabilize ecological integrity to the adjacent native shrub-steppe community, to prevent invasion by noxious weeds and non-native species, and to stabilize soils and reduce erosion that threatens site degradation.

VI. References

"Columbia National Wildlife Refuge Wildlife and Habitats." Available: http://www.fws.gov/columbiarefuge/WildlifeandHabitat/habitats.html

Nus Corporation. 1981. Final report; Columbia National Wildlife Refuge Habitat and Wildlife Inventory, Contract # 14-16-0001-79198.

APPENDIX II - ENVIRONMENTAL COMPLIANCE

Federal, State, and Private Lands Environmental Compliance Responsibilities

All projects proposed in the UPPER GOOSE Fire Burned Area Emergency Response Plan that are prescribed, funded, or implemented by Federal agencies on Federal, State, or private lands are subject to compliance with the National Environmental Policy Act (NEPA) in accordance with the guidelines provided by the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508); Department of the Interior and FISH AND WILDLIFE SERVICE. This Appendix documents the burned area emergency response team considerations of NEPA compliance requirements for prescribed emergency stabilization and monitoring actions described in this plan for all jurisdictions affected by the UPPER GOOSE Fire.

Related Plans and Cumulative Impact Analysis

COLUMBIA NATIONAL WILDLIFE REFUGE Fire Burned Area Emergency Response Plan September 18, 2007. The COLUMBIA NATIONAL WILDLIFE REFUGE Fire Burned Area Emergency Response Plan was reviewed and it was determined that actions proposed in the UPPER GOOSE Fire Burned Area Emergency Response Plan within the boundary of the COLUMBIA NATIONAL WILDLIFE REFUGE Fire are consistent with the management objectives established in the Comprehensive Conservation Plan. The Comprehensive Conservation Plan NEPA compliance process specifically addresses:

Cumulative Impact Analysis

Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, both Federal and non-Federal. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. The emergency stabilization treatments for areas affected by the UPPER GOOSE Fire, as proposed in the UPPER GOOSE Fire Burned Area Emergency Response Plan, do not result in an intensity of impact (i.e. major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

Applicable and Relevant Categorical Exclusions

The individual actions proposed in this plan for COLUMBIA NATIONAL WILDLIFE REFUGE are Categorically Excluded from further environmental analysis. All applicable and relevant Department and Agency Categorical Exclusions are listed below. Categorical Exclusion decisions were made with consideration given to the results of required emergency consultations completed by the Burned area emergency response team and documented below.

Statement of Compliance for the UPPER GOOSE Fire Burned Area Emergency Response Plan.

This section documents consideration given to the requirements of specific environmental laws in the development of the UPPER GOOSE Fire Burned Area Emergency Response Plan. Specific consultations initiated or completed during development and implementation of this plan are also

documented. The following executive orders and legislative acts have been reviewed as they apply to the UPPER GOOSE Fire Burned Area Emergency Response Plan:

- National Historic Preservation Art (NHPA).
- Executive Order 11988. Floodplain Management.
- Executive Order 11990. Protection of Wetlands.
- Executive Order 12372. Intergovernmental Review.
- Executive Order 12892. Federal Actions to Address Environmental Justice in Minority and Lowincome Populations.
- Endangered Species Act.
- Secretarial Order 3127. Federal Contaminated
- Clean Water Act.
- Clean Air Act.

CONSULTATIONS

• Please see Appendix I, Assessments.

NEPA Checklist: If any of the following exception applies, the Burned Area Emergency Response Plan cannot be Categorically Excluded and an Environmental Assessment (EA) is required.

| (Yes) (| |
|---------|--|
| () (| X) Adversely affect Public Health and Safety X) Adversely affect historic or cultural resources, wilderness, wild and scenic rivers aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or Natural Landmarks. X) Have highly controversial environmental effects. |
| ` ' ' | X) Have highly uncertain environmental effects or involve unique or unknown environmental risks. |
| | X) Establish a precedent resulting in significant environmental effects. X) Relates to other actions with individually insignificant but cumulatively significant environmental effects. |
| ()(| \boldsymbol{X}) Adversely effects properties listed or eligible for listing in the National Register of Historic Places |
| | X) Adversely affect a species listed or proposed to be listed as Threatened or Endangered. X) Threaten to violate any laws or requirements imposed for the "protection of the environment" such as Executive Order 1 1988 (Floodplain Management) or Executive Order 1 1990 (Protection of Wetlands). |
| Nation | al Historic Preservation Act |
| Ground | l Disturbance: |
| () | None Ground disturbance did occur and an archeologist survey, required under section 110 of the NHPA will be prepared. A report will be prepared under contract as specified by the Burned Area Emergency Response Plan. |
| A NHP | A Clearance Form: |
| | Is required because the project may have affected a site that is eligible or on the national register. The clearance form is attached. SHPO has been consulted under Section 106 (see Cultural Resource Assessment, Appendix I). |
| | Is not required because the Burned Area Emergency Response Plan has no potential to affect cultural resources (initial of cultural resource specialist). |
| Other | Requirements |
| (Yes) | (No) |
| () | () Does the Burned Area Emergency Response Plan have potential to affect any Native American uses? If so, consultation with affiliated tribes is needed. |
| () | (X) Are any toxic chemicals, including pesticides or treated wood, proposed for use? If so, local agency integrated pest management specialists must be consulted. |

I have reviewed the proposals in the UPPER GOOSE Fire Burned Area Emergency Response Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effect. Therefore it is categorically excluded from further environmental (NEPA) review and documentation. Burned area emergency response team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environment review requirements.

| Robert Krueger | Date |
|--|------|
| Burned Area Emergency Response Team Environmental Protection Specialis | t |
| | |
| | |
| | |
| | _ |
| Gregory Hughes | Date |

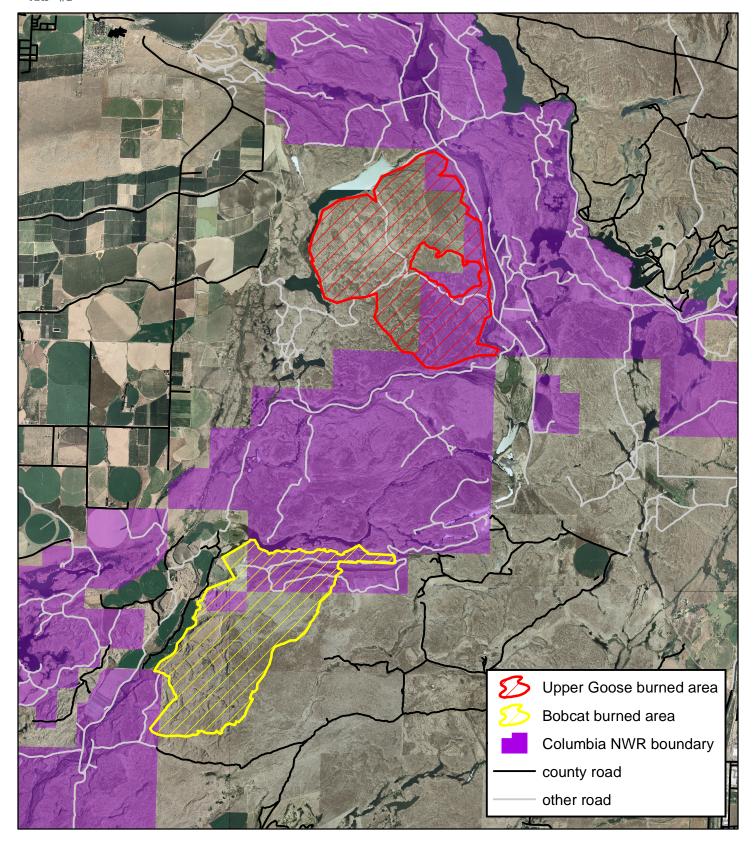
Project Leader, COLUMBIA NATIONAL WILDLIFE REFUGE

APPENDIX III - MAPS

MAPS, 7 Pages (all are .pdf format)

All maps are created in GIS using GPS location information and GIS layers. These Maps are .pdf documents, and will be printed and attached in the following order, or included electronically as a separate file containing all Maps.

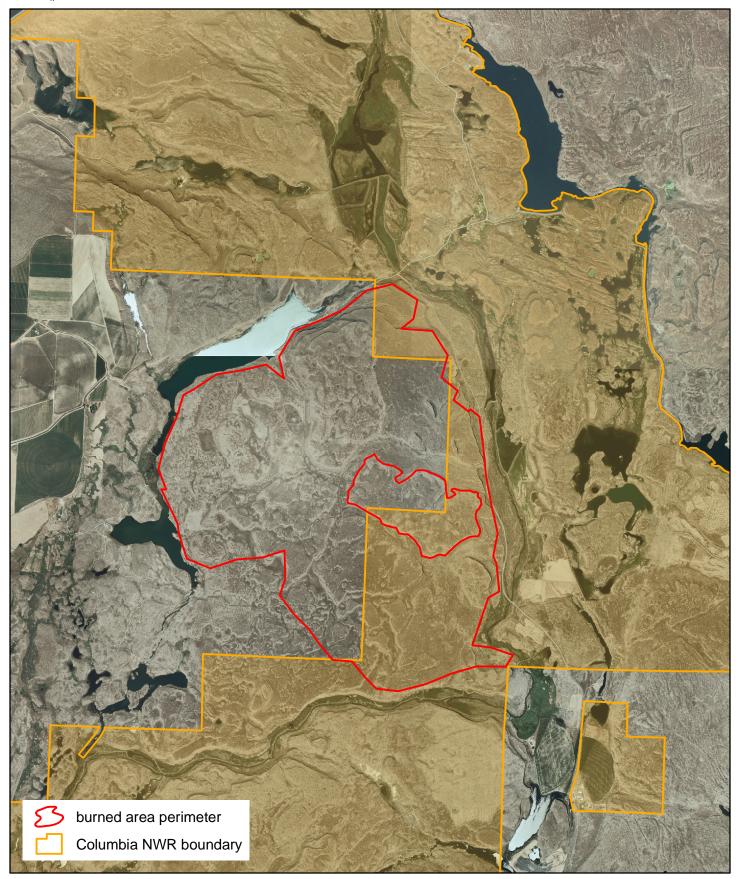
- Upper Goose and Bobcat Fire on Columbia NWR, 6 September 2007
- Upper Goose Fire Burned Area, 6 September 2007
- Upper Goose Fire Burned Area, 31 July 2007
- Upper Goose Fire Burned Area, 31 July 2007
- Upper Goose Fire Vegetation Cover, 5 September 2007
- Upper Goose Fire Soils, 6 September 2007
- Upper Goose Fire and Bobcat Fire Listing per USFWS, 5 September 2007



Upper Goose and Bobcat Fires on Columbia NWR

File name: CNWR_fires_locator.mxd Map date: 6 September 2007



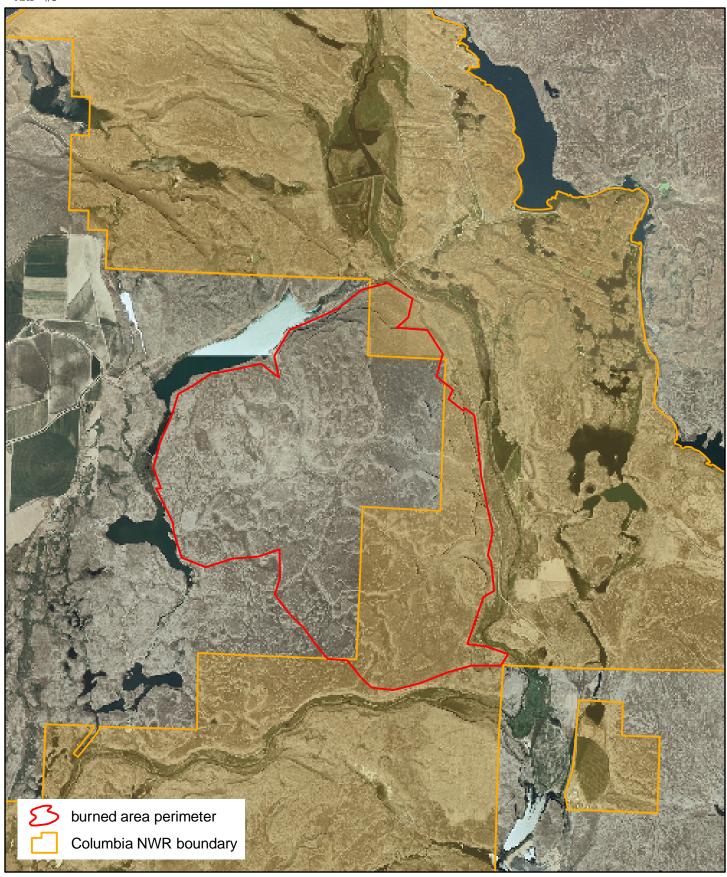


Upper Goose Fire -- Burned Area

File name: UGooseFire_burned_area.mxd

Map date: 6 September 2007

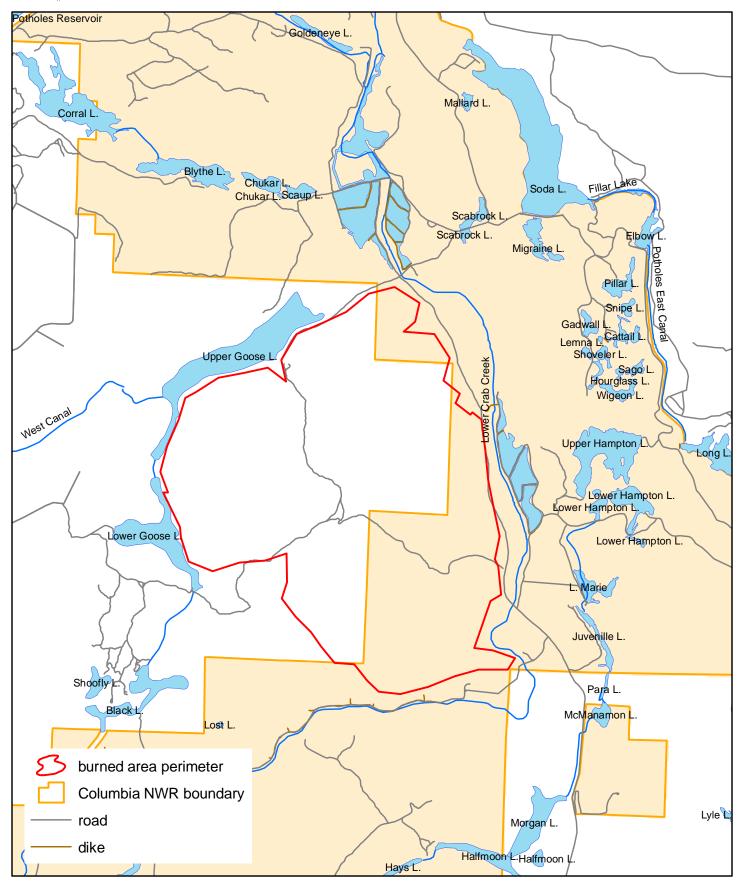




Upper Goose Fire -- Burned Area

File name: UGoose_burned_area.mxd Map date: 31 July 2007

0 J Mile



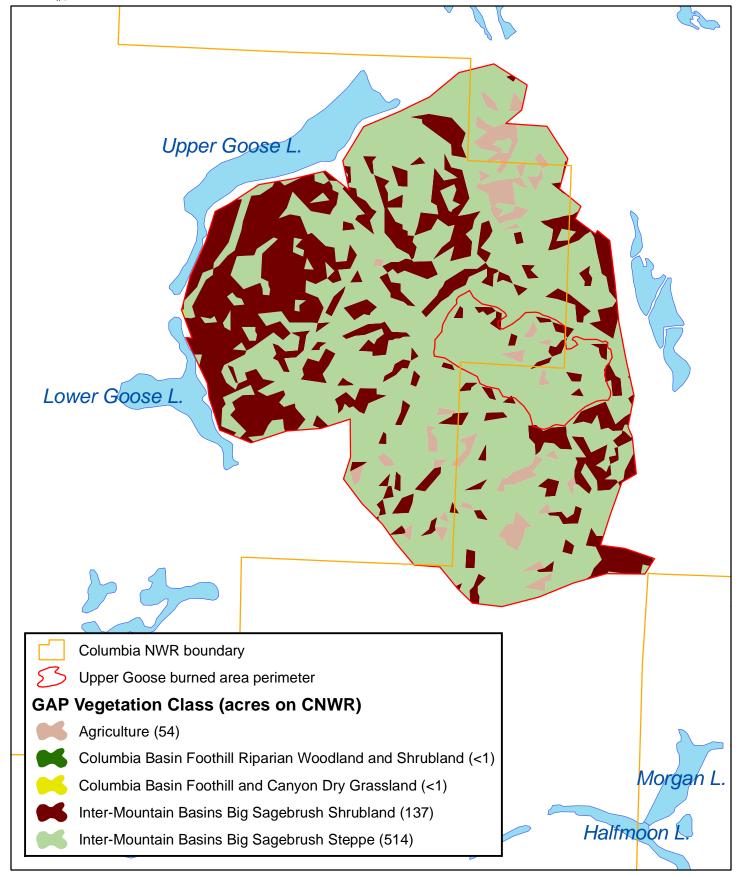
Upper Goose Fire -- Burned Area

File name: UGoose_burned_area.mxd

Map date: 31 July 2007

0

1 J Mile

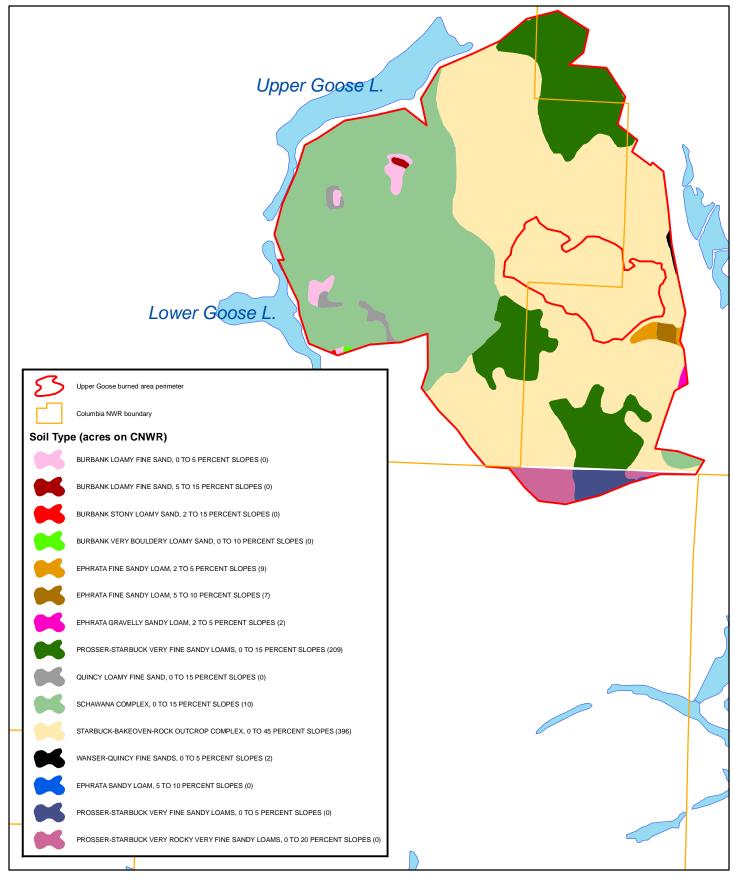


Upper Goose Fire -- Vegetation Cover

File name: UGooseFire_veg_cover.mxd Map date: 6 September 2007

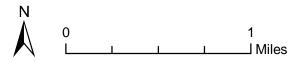






Upper Goose Fire -- Soils

File name: UGooseFire_soils.mxd Map date: 6 September 2007



(By FWS 9/6/07)

(By FW

| 3m, rn Intensity | 5% | Z 25-40% | 3 50-70% | 40% | Z 45% | 3 |
|----------------------|---------------------|----------------|----------------|---------------|---------|---------------|
| veg affected | | 95-10 | | | 90-950 | |
| breakdown appect | ed sage 95-10090 | bunch 95-100 | Cheat 95-100 | Sage 95-100 | 1 bunch | Checit 95+ |
| regeneration rate | 0-Z | | (| | | |
| intensive cheatgrass | invasion | | 20 | | | 40 |
| , Aerial seed | | 3/4 | acres | | 400 ac | res |
| Drill Seed | | 200 | acres | | 410 au | 6 |
| Sprown | | 514 | | | 810 | |

Bobcat

affected by wind erosion

BURNED AREA EMERGENCY STABILIZATION PLAN UPPER GOOSE FIRE- COLUMBIA NATIONAL WILDLIFE REFUGE

APPENDIX IV: PHOTO DOCUMENTATION – shrub-steppe

- Soil and Erosion Issues
- Vegetation Resources Issues
- Wildlife Resource Issues
- Public Safety and Access Issues



Soil and Erosion Issues



Photo 1. Heavy erosion at access to Upper Goose Fire.



Photo 2. Exposed erodable sandy soils.

<u>Vegetation Resources Issues</u>



Photo 3. Sagebrush totally consumed.



Photo 4. Expansive burned area looking south near west Refuge boundary.



Photo 5. Diffuse knapweed being spread by vehicles.

Wildlife Resource Issues



Photo 6. Ferruginous hawk nesting cliff



Photo 7. Burned bottoms and slopes showing mule deer trails.



Photo 8. Deer trails through burned shrub-steppe.

Public Safety and Access Issues



Photo 9. Burned boundary fence between Columbia Refuge and Washington Department of Fish and Wildlife managed lands



Photo 10. Upper Goose fire damage behind Bluebird Camp.

APPENDIX V - SUPPORT DOCUMENTS

- Cost/Risk Analysis
- Native-Non-native worksheet
- Section 7 Species List
- Washington State Species List

Cost/Risk Analysis

Part 1. Treatment Cost

| Treatments | Cost |
|--|--------------|
| Inventory and assess fire and suppression damage to cultural resources | \$22,519.90 |
| 2. Non-native invasive species control- Integrated Pest Management | \$61,993.00 |
| 3. Ecological Stabilization- Native Seeding | \$248,088.40 |
| 4. Emergency Stabilization Plan Development | \$32,400.00 |
| TOTAL | \$365,001.30 |

Part 2. Probability of Rehabilitation Treatments Successfully Meeting EFR Objectives

| Treatments | Units | % |
|--|--------------|-----|
| Inventory and assess fire and suppression damage to cultural resources | 705 Acres | 100 |
| Non-native invasive species control- Integrated Pest Management | 705 Acres | 75 |
| 3. Ecological Stabilization- Native Seeding | 705 Acres | 75 |
| 4. Emergency Stabilization Plan Development | 1 Plan | 100 |

Risk of Resource Value Loss or Damage

Identify the risk (high, medium, low, none or not applicable (NA) of unacceptable impacts or loss of resources.

No Action- Treatments Not Implemented (check one)

| Resource Value | None | Low | Mid | High |
|---|------|-----|-----|------|
| Lives | | Х | | |
| Residential & Commercial Property | | Х | | |
| Wildlife populations and Listed Species | | | | Х |
| Sensitive Plant Communities and rare plants | | | | Х |
| Ecological Stability | | | | Х |
| Site Productivity | | | | X |
| Weed Invasion | | | | Х |
| Cultural Resources | | | Х | |

Proposed Action - Treatments Successfully Implemented (check one)

| Resource Value | None | Low | Mid | High |
|---|------|-----|-----|------|
| Lives | X | | | |
| Residential & Commercial Property | Х | | | |
| Wildlife populations and Listed Species | | X | | |
| Sensitive Plant Communities and rare plants | | X | | |
| Ecological Stability | X | | | |
| Site Productivity | X | | | |
| Weed Invasion | Х | | | |
| Cultural Resources | Х | | | |

Part 3. SUMMARY

The costs of the project and probability of success of the proposed treatments are compared with the risks to resource values if: 1) no action is taken, and 2) the proposed action is successfully implemented. Alternatives may be included in this analysis to assist in the selection of the treatments that will cost effectively achieve the EFR objectives. Answer the following questions to determine which proposed EFR treatments should be selected and implemented.

1. Are the risks to natural resources and private property **acceptable** as a result of the fire if the following actions are taken?

Proposed Action Yes | ____ | No | X | Rationale for answer:

Non-native invasive species control. Integrated Pest Management and Revegetation Invasive species control. The detection, control and monitoring of non-native invasive species in burned areas and the prevention of the expansion of known populations into newly disturbed areas will present no risk to cultural resources and will prevent the spread of nonnative invasive species to private property.

Ecological Stabilization- Native Seeding. Stabilization of erosion prone soil will prevent traffic hazard along Highway 240 and county roads. Stabilization of soils will prevent erosion, dust storms, from delivering soils to private lands areas and will prevent health hazards (breathing difficulties or allergy symptoms) for local residents. This process will also help maintain site productivity and buffer sensitive plant communities to invasion of non-native species.

Protective Fencing Replacement and Public Safety, Warning Signs. The repair of existing fence to direct the public use and access and to exclude livestock from burned area is necessary until native vegetation can be reestablished, and for protection of Monument resources. Grazing was prohibited on the Monument through Presidential proclamation. Fence and signs will direct the public and reduce trespass into sensitive areas. Further, this will benefit cultural resources as fence will reduce trespass and reduce looting.

Effectiveness Monitoring. Documentation of the success of treatments is important in order to justify the costs associated with large projects that require public funds. It would be irresponsible to expend public funds without documenting the effectiveness and value of the stabilization treatments.

No Action Yes | No | X | Rationale for answer:

No the risks to cultural resources and private property are not acceptable. Non-native invasive plants and unacceptable soil erosion could significantly impact the Monument's resources and will likely affect private property. Ecological function will be reduced and sensitive plant communities and wildlife will be impacted. Cultural resources will incur additional damage if fences are not repaired. The public trust will be violated because

| the long-term management of this area was entrusted to the Department of Interior. Permanent site degradation will reduce the areas ability to support priority public uses. |
|---|
| Alternative(s) Yes No Rationale for answer: NONE |
| 2. Is the probability of success of the proposed action, alternatives or no action acceptable given their costs? |
| Proposed Action Yes X No Rationale for answer: |
| The actions have been rated as having a high probability of success. Previous efforts to conduct similar post-fire stabilization on the Hanford Reach National Monument have been highly successful. The proposed treatments will not only protect public safety and private property by controlling erosion and weed spread, but will also protect site productivity, ecological function and cultural resources. Protection of sensitive shrubsteppe habitat and obligate wildlife species will not only benefit these resources but will improve their condition as re-growth occurs. |
| No Action Yes No X Rationale for answer: |
| Failure to protect and stabilize this area would impact nationally significant resources and create a public safety hazard. Failure to stabilize highly mobile and erosion prone soils will cause wind borne dust storms to reduce visibility along major traffic routes and increase the health hazard due to breathing difficulties or allergies of local residents. Failure to prevent the spread of non-native plants will increase the long term costs of managing these lands, increase fire risks, reduce critical habitat for many wildlife species, and reduce potential management of listed species and reintroduction sites for listed species. |
| Alternative(s) Yes No Rationale for answer: None. |
| 3. Which approach will most cost-effectively and successfully attain the EFR objectives and therefore is recommended for implementation from a Cost/Risk Analysis standpoint? |
| Proposed Action , Alternative(s) , or No Action |

GRANT COUNTY Updated 8/8/2007

LISTED

Endangered

Pygmy rabbit (Brachylagus idahoensis) – Columbia Basin distinct population segment

Threatened

Bull trout (*Salvelinus confluentus*) – Columbia River distinct population segment *Spiranthes diluvialis* (Ute ladies'-tresses), plant

CANDIDATE

Greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin distinct population segment

Washington ground squirrel (*Spermophilus washingtoni*)

Artemisia campestris ssp. borealis var. wormskioldii (Northern wormwood), plant

SPECIES OF CONCERN

Animals

Bald eagle (Haliaeetus leucocephalus) (delisted, monitor status)

Burrowing owl (Athene cunicularia)

California floater (Anodonta californiensis), mussel

Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus)

Ferruginous hawk (Buteo regalis)

Giant Columbia spire snail (Fluminicola columbiana)

Kincaid meadow vole (Microtus pennsylvanicus kincaidi)

Loggerhead shrike (Lanius ludovicianus)

Long-eared myotis (*Myotis evotis*)

Northern goshawk (Accipiter gentilis)

Northern leopard frog (Rana pipiens)

Pacific lamprey (Lampetra tridentata)

Pallid Townsend's big-eared bat (Corynorhinus townsendii pallescens)

Redband trout (Oncorhynchus mykiss)

River lamprey (Lampetra ayresi)

Sagebrush lizard (Sceloporus graciosus)

Western brook lamprey (Lampetra richardsoni)

Vascular Plants

Cryptantha leucophaea (Gray cryptantha)
Lomatium tuberosum (Hoover's desert-parsley)
Oxytropis campestris var. wanapum (Wanapum crazyweed)

ADAMS COUNTY Updated 8/8/2007

LISTED

Endangered

Pygmy rabbit (*Brachylagus idahoensis*) – Columbia Basin distinct population segment

Threatened

Spiranthes diluvialis (Ute ladies'-tresses), plant

CANDIDATE

Washington ground squirrel (Spermophilus washingtoni)

SPECIES OF CONCERN

<u>Animals</u>

Bald eagle (Haliaeetus leucocephalus) (delisted, monitor status)
Burrowing owl (Athene cuniculari)
Ferruginous hawk (Buteo regalis)
Loggerhead shrike (Lanius ludovicianus)
Long-eared myotis (Myotis evotis)

Northern leopard frog (*Rana pipiens*)

Pallid Townsend's big-eared bat (Corynorhinus townsendii pallenscens)

Sagebrush lizard (Sceloporus graciosus)

Vascular Plants

Polemonium pectinatum (Washington polemonium)

Exhibit 6-1 NATIVE/NON-NATIVE PLANT WORKSHEET

The Seed Mix listed below has been requested by USFWS for use on the Upper Goose Fire ES Plan on September 5, 2007 and is included in Part F and Appendix I of this ES Plan.

<u>Grasses</u>

| Needle and thread grass (Stipa comata) | 0.2 lbs/acre |
|---|-----------------|
| Sandberg's bluegrass (Poa sandbergii) (Hanford) | 2 lbs./ac. PLS |
| Bottlebrush squirreltail (Elymus elymoides) | 1.5 lbs./ac PLS |
| Bluebunch wheatgrass (Pseudoroegneria spicata) | 4 lbs./ac PLS |
| Sand dropseed | |

Shrubs

Wyoming Big Sagebrush (Artemisia tridentate ssp. wyomingensis) 0.1 lbs/ac PLS



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Species of Concern

State Species of Concern

Include those species listed as State Endangered, State Threatened, State Sensitive, or State Candidate, as well as species listed or proposed for listing by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

Search Species Lists

SORT RESULTS BY:

Common Name Scientific Name Animal Type

Advanced Search

Species of Concern Lists

- Endangered Species
- Threatened Species
- Sensitive Species
- State Candidate Species
- Complete SOC List
- Main SOC Page

Status Codes:

FE: Federal Endangered FT: Federal Threatened FC: Federal Candidate

FCo: Federal Species of Concern

SE: State Endangered ST: State Threatened SC: State Candidate SS: State Sensitive

Mapping Criteria Codes:

(listed in order of decreasing specificity)
B: Breeding Location (Nest or Den)
CR: Communal Roost
RC,RLC,RSC: Regular (Large or Small) Concentration
RI: Regular Individual
IO: Individual Occurrence
(If a less specific criterion is listed, then the more specific criteria are implied as well)

Related Links

Species of Concern in Washington State

Current through June 13, 2007

| | COMMON NAME | SCIENTIFIC NAME | ANIMAL TYPE | FEDERAL STATUS | STATE STATUS | MAPPING CRITERIA |
|---|-------------------------------|----------------------------|----------------|-------------------|-----------------|---------------------|
| | WESTERN TOAD | BUFO BOREAS | Amphibian | FCo | SC | Ю |
| | NORTHERN LEOPARD FROG | RANA PIPIENS | Amphibian | FCo | SE | Ю |
| | OREGON SPOTTED FROG | RANA PRETIOSA | Amphibian | FC | SE | Ю |
| | COLUMBIA SPOTTED FROG | RANA LUTEIVENTRIS | Amphibian | none | SC | Ю |
| | CASCADE TORRENT SALAMANDER | RHYACOTRITON CASCADAE | Amphibian | none | SC | Ю |
| ı | DUNN'S SALAMANDER | PLETHODON DUNNI | Amphibian | none | SC | Ю |
| | LARCH MOUNTAIN SALAMANDER | PLETHODON LARSELLI | Amphibian | FCo | SS | Ю |
| | VAN DYKE'S SALAMANDER | PLETHODON VANDYKEI | Amphibian | FCo | SC | Ю |
| | ROCKY MOUNTAIN TAILED FROG | ASCAPHUS MONTANUS | Amphibian | none | SC | Ю |
| | COMMON LOON | GAVIA IMMER | Bird | none | SS | В |
| | WESTERN GREBE | AECHMOPHORUS OCCIDENTALIS | Bird | none | SC | В |
| | SHORT-TAILED ALBATROSS | PHOEBASTRIA ALBATRUS | Bird | FE | SC | Ю |
| | AMERICAN WHITE PELICAN | PELECANUS ERYTHRORHYNCHOS | Bird | none | SE | B,RSC |
| | BROWN PELICAN | PELECANUS OCCIDENTALIS | Bird | FE | SE | RSC |
| | BRANDT'S CORMORANT | PHALACROCORAX PENICILLATUS | Bird | none | SC | В |
| | GOLDEN EAGLE | AQUILA CHRYSAETOS | Bird | none | SC | В |
| | BALD EAGLE | HALIAEETUS LEUCOCEPHALUS | Bird | FT | ST | B,RSC,CR |
| | NORTHERN GOSHAWK | ACCIPITER GENTILIS | Bird | FCo | SC | В |
| | FERRUGINOUS HAWK | BUTEO REGALIS | Bird | FCo | ST | В |
| | MERLIN | FALCO COLUMBARIUS | Bird | none | SC | В |
| | PEREGRINE FALCON | FALCO PEREGRINUS | Bird | FCo | SS | B,RI |
| | AMERICAN PEREGRINE FALCON | FALCO PEREGRINUS ANATUM | Bird | FCo | SS | B,RI |
| | ARCTIC PEREGRINE FALCON | FALCO PEREGRINUS TUNDRIUS | Bird | FCo | SS | RI |
| | PEALE'S PEREGRINE FALCON | FALCO PEREGRINUS PEALEI | Bird | FCo | SS | B,RI |
| | SHARP-TAILED GROUSE | TYMPANUCHUS PHASIANELLUS | Bird | FCo | ST | B,RSC |
| | SAGE GROUSE | CENTROCERCUS UROPHASIANUS | Bird | FC | ST | B,RSC |
| | SANDHILL CRANE | GRUS CANADENSIS | Bird | none | SE | B,RLC |
| | SNOWY PLOVER | CHARADRIUS ALEXANDRINUS | Bird | FT | SE | В |
| | UPLAND SANDPIPER | BARTRAMIA LONGICAUDA | Bird | none | SE | B,RI |
| | COMMON MURRE | URIA AALGE | Bird | none | SC | B,RC |
| | MARBLED MURRELET | BRACHYRAMPHUS MARMORATUS | Bird | FT | ST | В |
| | CASSIN'S AUKLET | PTYCHORAMPHUS ALEUTICUS | Bird | FCo | SC | В |
| | TUFTED PUFFIN | FRATERCULA CIRRHATA | Bird | FCo | SC | RLC |
| | YELLOW-BILLED CUCKOO | COCCYZUS AMERICANUS | Bird | FC | SC | B,RI |
| | BURROWING OWL | ATHENE CUNICULARIA | Bird | FCo | SC | В |

• State Monitor Species

| FLAMMULATED OWL | OTUS FLAMMEOLUS | Bird | none | SC | B,RI |
|--|-----------------------------------|----------------|------|------|------|
| SPOTTED OWL | STRIX OCCIDENTALIS | Bird | FT | SE | Ю |
| VAUX'S SWIFT | CHAETURA VAUXI | Bird | none | SC | B,CR |
| LEWIS' WOODPECKER | MELANERPES LEWIS | Bird | none | SC | В |
| PILEATED WOODPECKER | DRYOCOPUS PILEATUS | Bird | none | SC | В |
| WHITE-HEADED WOODPECKER | PICOIDES ALBOLARVATUS | Bird | none | SC | B,RI |
| BLACK-BACKED WOODPECKER | PICOIDES ARCTICUS | Bird | none | SC | B,RI |
| PURPLE MARTIN | PROGNE SUBIS | Bird | none | SC | В |
| SLENDER-BILLED WHITE- BREASTED NUTHATCH | SITTA CAROLINENSIS ACULEATA | Bird | FCo | SC | Ю |
| LOGGERHEAD SHRIKE | LANIUS LUDOVICIANUS | Bird | FCo | SC | В |
| OREGON VESPER SPARROW | POOECETES GRAMINEUS AFFINIS | Bird | FCo | SC | В |
| SAGE SPARROW | AMPHISPIZA BELLI | Bird | none | SC | В |
| SAGE THRASHER | OREOSCOPTES MONTANUS | Bird | none | SC | В |
| STREAKED HORNED LARK | EREMOPHILA ALPESTRIS STRIGATA | Bird | FC | SE | В |
| ISLAND MARBLE | EUCHLOE AUSONIDES INSULANUS | Butterfly/Moth | FCo | SC | Ю |
| MAKAH (QUEEN CHARLOTTE) COPPER | LYCAENA MARIPOSA CHARLOTTENSIS | Butterfly/Moth | FCo | SC | Ю |
| PUGET BLUE | PLEBEJUS ICARIOIDES BLACKMOREI | Butterfly/Moth | none | SC | Ю |
| VALLEY SILVERSPOT | SPEYERIA ZERENE BREMNERII | Butterfly/Moth | FCo | SC | Ю |
| GREAT ARCTIC | OENEIS NEVADENSIS GIGAS | Butterfly/Moth | none | SC | Ю |
| OREGON SILVERSPOT BUTTERFLY | SPEYERIA ZERENE HIPPOLYTA | Butterfly/Moth | FT | SE | Ю |
| MARDON SKIPPER | POLITES MARDON | Butterfly/Moth | FC | SE | Ю |
| SHEPARD'S PARNASSIAN | PARNASSIUS CLODIUS SHEPARDI | Butterfly/Moth | none | SC | Ю |
| SILVER-BORDERED FRITILLARY | BOLORIA SELENE ATROCOSTALIS | Butterfly/Moth | none | SC | Ю |
| JOHNSON'S HAIRSTREAK | MITOURA JOHNSONI | Butterfly/Moth | none | SC | Ю |
| JUNIPER HAIRSTREAK | MITOURA GRYNEA BARRYI | Butterfly/Moth | none | SC | Ю |
| CHINQUAPIN HAIRSTREAK | HABRODAIS GRUNUS HERRI | Butterfly/Moth | none | SC | Ю |
| YUMA SKIPPER | OCHLODES YUMA | Butterfly/Moth | none | SC | Ю |
| TAYLOR'S CHECKERSPOT | EUPHYDRYAS EDITHA TAYLORI | Butterfly/Moth | FC | SE | Ю |
| SAND-VERBENA MOTH | COPABLEPHARON FUSCUM | Butterfly/Moth | none | SC | Ю |
| RIVER LAMPREY | LAMPETRA AYRESI | Fish | FCo | SC | Ю |
| PACIFIC HERRING (CHERRY POINT) | CLUPEA PALLASI | Fish | FC | SC | Ю |
| PACIFIC HERRING (DISCOVERY BAY) | CLUPEA PALLASI | Fish | FC | SC | Ю |
| CHUM SALMON (HOOD CANAL SU) | ONCORHYNCHUS KETA | Fish | FT | SC | none |
| CHUM SALMON (LOWER COLUMBIA) | ONCORHYNCHUS KETA | Fish | FT | SC | none |
| COHO SALMON (LOWER COLUMBIA/SW WA) | ONCORHYNCHUS KISUTCH | Fish | FC | none | none |
| SOCKEYE SALMON (SNAKE R.) | ONCORHYNCHUS NERKA | Fish | FE | SC | none |
| SOCKEYE SALMON (OZETTE LAKE) | ONCORHYNCHUS NERKA | Fish | FT | SC | none |
| CHINOOK SALMON (PUGET SOUND) | ONCORHYNCHUS TSHAWYTSCHA | Fish | FT | SC | none |
| CHINOOK SALMON (UPPER COLUMBIA SP) | ONCORHYNCHUS TSHAWYTSCHA | Fish | FE | SC | none |
| CHINOOK SALMON (LOWER COLUMBIA) | ONCORHYNCHUS TSHAWYTSCHA | Fish | FT | SC | none |
| | | | | | |

| CHINOOK SALMON (SNAKE R. SP/SU) | ONCORHYNCHUS TSHAWYTSCHA | Fish | FT | SC | none |
|--------------------------------------|---------------------------------------|--------|------|----|------|
| CHINOOK SALMON (SNAKE R. FALL) | ONCORHYNCHUS TSHAWYTSCHA | Fish | FT | SC | none |
| STEELHEAD (SNAKE RIVER) | ONCORHYNCHUS MYKISS | Fish | FT | SC | none |
| STEELHEAD (MIDDLE COLUMBIA) | ONCORHYNCHUS MYKISS | Fish | FT | SC | none |
| STEELHEAD (UPPER COLUMBIA) | ONCORHYNCHUS MYKISS | Fish | FT | SC | none |
| STEELHEAD (PUGET SOUND) | ONCORHYNCHUS MYKISS | Fish | FT | | none |
| STEELHEAD (LOWER COLUMBIA) | ONCORHYNCHUS MYKISS | Fish | FT | SC | none |
| BULL TROUT | SALVELINUS CONFLUENTUS | Fish | FT | SC | none |
| BULL TROUT (COLUMBIA BASIN) | SALVELINUS CONFLUENTUS | Fish | FT | SC | none |
| BULL TROUT (COASTAL/ PUGET SOUND) | SALVELINUS CONFLUENTUS | Fish | FT | SC | none |
| EULACHON | THALEICHTHYS PACIFICUS | Fish | none | SC | RC |
| OLYMPIC MUDMINNOW | NOVUMBRA HUBBSI | Fish | none | SS | Ю |
| PYGMY WHITEFISH | PROSOPIUM COULTERI | Fish | FCo | SS | Ю |
| LAKE CHUB | COUESIUS PLUMBEUS | Fish | none | SC | Ю |
| LEOPARD DACE | RHINICHTHYS FALCATUS | Fish | none | SC | Ю |
| UMATILLA DACE | RHINICHTHYS UMATILLA | Fish | none | SC | Ю |
| MOUNTAIN SUCKER | CATOSTOMUS PLATYRHYNCHUS | Fish | none | SC | Ю |
| PACIFIC COD (S&C PUGET SOUND) | GADUS MACROCEPHALUS | Fish | FCo | SC | Ю |
| PACIFIC HAKE (C. PUGET SOUND) | MERLUCCIUS PRODUCTUS | Fish | FCo | SC | Ю |
| WALLEYE POLLOCK (SO. PUGET SOUND) | THERAGRA CHALCOGRAMMA | Fish | FCo | SC | Ю |
| BROWN ROCKFISH | SEBASTES AURICULATUS | Fish | FCo | SC | Ю |
| COPPER ROCKFISH | SEBASTES CAURINUS | Fish | FCo | SC | Ю |
| GREENSTRIPED ROCKFISH | SEBASTES ELONGATUS | Fish | none | SC | Ю |
| WIDOW ROCKFISH | SEBASTES ENTOMELAS | Fish | none | SC | Ю |
| YELLOWTAIL ROCKFISH | SEBASTES FLAVIDUS | Fish | none | SC | Ю |
| QUILLBACK ROCKFISH | SEBASTES MALIGER | Fish | FCo | SC | Ю |
| BLACK ROCKFISH | SEBASTES MELANOPS | Fish | none | SC | Ю |
| CHINA ROCKFISH | SEBASTES NEBULOSUS | Fish | none | SC | Ю |
| TIGER ROCKFISH | SEBASTES NIGROCINCTUS | Fish | none | SC | Ю |
| BOCACCIO ROCKFISH | SEBASTES PAUCISPINIS | Fish | none | SC | Ю |
| CANARY ROCKFISH | SEBASTES PINNIGER | Fish | none | SC | Ю |
| REDSTRIPE ROCKFISH | SEBASTES PRORIGER | Fish | none | SC | Ю |
| YELLOWEYE ROCKFISH | SEBASTES RUBERRIMUS | Fish | none | SC | Ю |
| MARGINED SCULPIN | COTTUS MARGINATUS | Fish | FCo | SS | IO |
| MERRIAM'S SHREW | SOREX MERRIAMI | Mammal | none | SC | IO |
| KEEN'S MYOTIS | MYOTIS KEENII | Mammal | none | SC | B,IO |
| TOWNSEND'S BIG-EARED BAT | CORYNORHINUS TOWNSENDII | Mammal | FCo | SC | B,CR |
| PACIFIC TOWNSEND'S BIG- EARED BAT | TOWNSENDII | Mammal | FCo | SC | B,CR |
| PALLID TOWNSEND'S BIG- EARED BAT | CORYNORHINUS TOWNSENDII PALLESCENS | Mammal | FCo | SC | B,CR |
| PYGMY RABBIT | BRACHYLAGUS IDAHOENSIS | Mammal | FE | SE | Ю |
| WHITE-TAILED JACKRABBIT | LEPUS TOWNSENDII | Mammal | none | SC | Ю |

| BLACK-TAILED JACKRABBIT | LEPUS CALIFORNICUS | Mammal | none | SC | Ю |
|-----------------------------------|---------------------------------------|--------------|--------|----|----------|
| WESTERN GRAY SQUIRREL | SCIURUS GRISEUS | Mammal | FCo | ST | Ю |
| WASHINGTON GROUND SQUIRREL | SPERMOPHILUS WASHINGTONI | Mammal | FC | SC | Ю |
| TOWNSEND'S GROUND SQUIRREL | SPERMOPHILUS TOWNSENDII TOWNSENDII | Mammal | none | SC | Ю |
| MAZAMA (WESTERN) POCKET GOPHER | THOMOMYS MAZAMA | Mammal | FC | ST | Ю |
| SHELTON POCKET GOPHER | THOMOMYS MAZAMA COUCHI | Mammal | FC | ST | Ю |
| OREGON POCKET GOPHER | THOMOMYS MAZAMA OREGONUS | Mammal | none | ST | Ю |
| CATHLAMET POCKET GOPHER | THOMOMYS MAZAMA LOUIEI | Mammal | FC | ST | Ю |
| OLYMPIC POCKET GOPHER | THOMOMYS MAZAMA MELANOPS | Mammal | FC | ST | Ю |
| YELM POCKET GOPHER | THOMOMYS MAZAMA YELMENSIS | Mammal | FC | ST | Ю |
| GRAY-TAILED VOLE | MICROTUS CANICAUDUS | Mammal | none | SC | Ю |
| GRAY WOLF | CANIS LUPUS | Mammal | FE | SE | Ю |
| GRIZZLY BEAR | URSUS ARCTOS | Mammal | FT | SE | Ю |
| FISHER | MARTES PENNANTI | Mammal | FC | SE | 10 |
| WOLVERINE | GULO GULO | Mammal | FCo | SC | 10 |
| SEA OTTER | ENHYDRA LUTRIS | Mammal | FCo | SE | B,RI,RSC |
| SEA OTTER | ENHYDRA LUTRIS LUTRIS | Mammal | | SE | B,RI,RSC |
| LYNX | | | none | ST | IO |
| | LYNX CANADENSIS | Mammal | FT | | |
| GRAY WHALE | ESCHRICHTIUS ROBUSTUS | Mammal | none | SS | 10 |
| SEI WHALE | BALAENOPTERA BOREALIS | Mammal | FE | SE | 10 |
| FIN WHALE | BALAENOPTERA PHYSALUS | Mammal | FE | SE | 10 |
| BLUE WHALE | BALAENOPTERA MUSCULUS | Mammal | FE | SE | Ю |
| HUMPBACK WHALE | MEGAPTERA NOVAEANGLIAE | Mammal | FE | SE | Ю |
| BLACK RIGHT WHALE | BALAENA GLACIALIS | Mammal | FE | SE | Ю |
| KILLER WHALE | ORCINUS ORCA | Mammal | FE | SE | Ю |
| PACIFIC HARBOR PORPOISE | PHOCOENA PHOCOENA | Mammal | none | SC | RSC |
| SPERM WHALE | PHYSETER MACROCEPHALUS | Mammal | FE | SE | Ю |
| COLUMBIAN WHITE- TAILED DEER | ODOCOILEUS VIRGINIANUS LEUCURUS | Mammal | FE | SE | Ю |
| WOODLAND CARIBOU | RANGIFER TARANDUS | Mammal | FE | SE | Ю |
| STELLER SEA LION | EUMETOPIAS JUBATUS | Mammal | FT | ST | RSC |
| PINTO ABALONE | HALIOTIS KAMTSCHATKANA | Mollusk | FCo | SC | Ю |
| OLYMPIA OYSTER | OSTREA LURIDA | Mollusk | none | SC | Ю |
| GIANT COLUMBIA RIVER LIMPET | FISHEROLA NUTTALLI | Mollusk | none | SC | Ю |
| GREAT COLUMBIA SPIRE SNAIL | FLUMINICOLA COLUMBIANA | Mollusk | FCo | SC | Ю |
| BLUE-GRAY TAILDROPPER | PROPHYSAON COERULEUM | Mollusk | none | SC | Ю |
| COLUMBIA OREGONIAN | CRYPTOMASTIX HENDERSONI | Mollusk | none | SC | Ю |
| POPLAR OREGONIAN | CRYPTOMASTIX POPULI | Mollusk | none | SC | Ю |
| DALLES SIDEBAND | MONADENIA FIDELIS MINOR | Mollusk | none | sc | Ю |
| NEWCOMB'S LITTORINE SNAIL | ALGAMORDA SUBROTUNDATA | Mollusk | FCo | SC | Ю |
| CALIFORNIA FLOATER | ANODONTA CALIFORNIENSIS | Mollusk | FCo | sc | Ю |
| COLUMBIA CLUBTAIL | GOMPHUS LYNNAE | Other Insect | FCo | SC | Ю |
| COLUMBIA RIVER TIGER | CICINDELA COLUMBICA | Other Insect | none | SC | Ю |
| BEETLE | | | - | - | |

| BOG IDOL LEAF BEETLE | DONACIA IDOLA | Other Insect | none | SC | Ю |
|--|-----------------------|--------------|------|----|---|
| HATCH'S CLICK BEETLE | EANUS HATCHI | Other Insect | FCo | SC | Ю |
| BELLER'S GROUND BEETLE | AGONUM BELLERI | Other Insect | FCo | SC | Ю |
| MANN'S MOLLUSK-EATING GROUND BEETLE | SCAPHINOTUS MANNII | Other Insect | none | SC | Ю |
| WESTERN POND TURTLE | CLEMMYS MARMORATA | Reptile | FCo | SE | Ю |
| LEATHERBACK SEA TURTLE | DERMOCHELYS CORIACEA | Reptile | FE | SE | Ю |
| GREEN SEA TURTLE | CHELONIA MYDAS | Reptile | FT | ST | Ю |
| SAGEBRUSH LIZARD | SCELOPORUS GRACIOSUS | Reptile | FCo | SC | Ю |
| LOGGERHEAD SEA TURTLE | CARETTA CARETTA | Reptile | FT | ST | Ю |
| SHARPTAIL SNAKE | CONTIA TENUIS | Reptile | FCo | SC | Ю |
| STRIPED WHIPSNAKE | MASTICOPHIS TAENIATUS | Reptile | none | SC | Ю |
| CALIFORNIA MOUNTAIN KINGSNAKE | LAMPROPELTIS ZONATA | Reptile | none | SC | Ю |

Find a bug or error in the system? Let us know about it!
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E-mail <webmaster@dfw.wa.gov>